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News Briefs . . .

(Complete Stories Inside)

ROUND TABLE discussions, which were held in Washington recently, are covered in this issue by Lawrence A. Long, Croplife editor. The story gives highlights of panel discussions by users and suppliers. **Story on page 1.**

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TEXAS GULF SULPHUR CO. has announced it will begin construction on a new $25 million potash mining and processing plant in southeastern Utah. According to the company, the plant is designed to produce over a million tons annually. **Story on page 2.**

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CONTRACT for the construction of a urea unit at the Joplin, Mo., facility of Solar Nitrogen Chemicals, Inc., has been let to Arthur G. McKee & Co. **Story on page 2.**

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A NEW PROCESS for the production of urea has been announced by Chemical Construction Corp., employing the principle of carbamate solution recycle. **Story on page 2.**

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WEST VIRGINIA PULP & PAPER CO. has announced its investment of $700,000 in improvements of facilities at Wellsburg, W.Va. Included will be the installation of a high-speed, stepped-end tuber, bottomer, press and bag machine. **Story on page 2.**

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MONSANTO CHEMICAL CO. has announced the opening of an ammonia plant in Luling, La., which it says is the first integrated chemical process to be commercially operated under closed computer control. **Story on page 28.**

Features Inside . . .

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ROUND TABLE PANELS—Both suppliers of fertilizer raw materials and manufacturers had their say at the Round Table meetings in Washington Nov. 2-4. Here are some of the panel members involved in the discussions. Top photo is group discussing preneutralization. They are, left to right: N. K. Alfrey, W. R. Grace & Co.; R. D. Young, Tennessee Valley Authority; H. Garrett, Minute Maid Co.; Grant C. Marburger, Spencer Chemical Co., and G. Gilliam, Nitrogen Division, Allied Chemical Corp.

Middle photo: Instrumentation panel members: William Law, Minneapolis-Honeywell Co.; William Strauss, Foxboro Manufacturing Co.; Don Warren, Omega Manufacturing Co., and Al Simmons, Fischer & Porter Co.

Bottom photo (standing): N. T. Wendt, American Potash & Chemical Co.; D. J. Bourne, Duval Sulphur & Potash Co., and Dean R. Gidney, Potash Company of America. (Seated): Van Rogers, Southwest Potash Co.; Robert Heck, International Minerals & Chemical Corp., and Dr. Ed Kapusta, U.S. Potash Co., division of U.S. Borax & Chemical Corp.

Panels on Uniformity Feature Round Table

WASHINGTON, D.C. — A panel of fertilizer manufacturers at the recent Fertilizer Industry Roundtable here were given the opportunity to express their views on how basic suppliers might be helpful in providing greater uniformity in product, while suppliers themselves made up other panels to explain to the audience their own side of the question. These panels were featured at the three day Roundtable Conference at the Mayflower Hotel, Nov. 2-4. (Activities of the first day of the Roundtable were reported in Croplife's issue of Nov. 7.)

H. L. Marshall, Olin Mathieson Chemical Corp., Baltimore, opened the discussion on standardization and uniformity of raw materials in the morning session of Thursday, Nov. 3. He emphasized the fact that every fertilizer manufacturer in the country tries his best to make each formula come out right so far as analysis is concerned. But, he said, "when a manufacturer has five or six carloads of material coming in to a limited storage building you have to mix it up." If these cars vary, he went on, there may be times when mixed analyses may be too low. "Even though it's only 1% or less, it is still short. This is a good reason why we need uniformity," he emphasized. Mr. Marshall also spoke about the variation in terminology, such as seen in expressions of P_2O_5, K_2O

(Turn to **ROUND TABLE**, page 6)

Texas Gulf Sulphur Announces $25 Million Potash Plant

NEW YORK—Texas Gulf Sulphur Co. will begin construction immediately on a new $25 million potash mining and processing plant in southeastern Utah, Claude O. Stephens, president, announced.

Mr. Stephens made the announcement following a special meeting of the company's board of directors. At the meeting, directors authorized the exercise of an option to acquire extensive potash reserves at Cane Creek, Utah, near the town of Moab. The option was granted to Texas Gulf by Delhi-Taylor Oil Corp.

The company previously disclosed that a core drilling program in the Cane Creek area had confirmed a very large potash deposit "believed to be richer than any known to exist in the U.S."

Mr. Stephens said the new plant is designed to produce annually up to "well over a million tons of muriate of potash," the form in which the bulk of all potash is sold. If construction schedules are maintained, the company expects to have potash in the market by the end of 1962.

"Diversification into potash is a natural development for Texas Gulf Sulphur because of our experience as an extractive company," Mr. Stephens stated. "Also, many of our present sulphur customers are in the fertilizer industry, which is the prime market for potash."

The initial mine shaft will have a depth of about 2,700 ft. and a diameter in the order of 20 ft. This is larger than initially planned and will enable the company later to supply ore adequate for an expanded plant. The company states that, by the end of 1963, capacity of the new plant may be raised to well over 1,500,000 tons of commercial output annually. The company believes that such expansion of capacity may well be warranted by the growth in demand for potash.

West Virginia Reveals Improvement Plans

NEW YORK—West Virginia Pulp & Paper Co. has announced the investment of $700,000 in improvements of its facilities at Wellsburg, W.Va., according to Victor S. Luke, manager, multiwall bag division.

Installation of a high-speed, stepped-end tuber, bottomer, press and bag machine at Wellsburg will increase production of pasted valve multiwalls from 3 to 6 million bags per month, Mr. Luke said. The plant is also installing a machine to make self-opening baler type bags used to package small consumer units of sugar, rice, salt and other products.

Mr. Luke said the additional production facilities would give the Wellsburg plant a full line of products designed to meet the needs of any multiwall user. The plant has facilities for making all types of sewn, pasted and open mouth bags.

The expansion at Wellsburg involves the building of a new warehouse of concrete tilt slab construction and the winterization of present storage facilities. The entire project will be completed early next year.

Production to Start At Phosphate Mine

VERNAL, UTAH — Production is scheduled to start in mid-December at the San Francisco Chemical Co.'s phosphate mine-mill complex 12 miles north of here, according to Robert Barcus, assistant general manager.

Phosphate concentrate from the 600,000-ton-a-year facility will be shipped by truck to the Western Phosphate, Inc., plant at Garfield for manufacture into triple superphosphate.

D. L. King, president and general manager of San Francisco Chemical Co., recently noted that since the Vernal deposit is some 100 miles from a railroad, the facility will have a limited growth until rail facilities are built into the Uinta Basin.

The company has a phosphate rock deposit containing 705 million tons of section running 20% P_2O_5. Of this tonnage, about one third is available under a maximum overburden of 30 ft., he said.

Mr. King said that the deposit could be strip-mined for many years without having to resort to underground methods.

Solar Nitrogen Lets Construction Contract For New Urea Facility in Missouri

WILMINGTON, DEL. — Contract for the construction of a urea unit at the Joplin, Mo., facility of Solar Nitrogen Chemicals, Inc., has been let to Arthur G. McKee & Co., of Cleveland, Ohio. This was jointly announced on Nov. 2 by Ralph K. Gottshall, president and chairman of the board of Atlas Powder Co., and Charles E. Spahr, president of the Standard Oil Co. (Ohio), whose companies share equal ownership of Solar.

Construction on this urea unit, to cost between $2 and $3 million, is to start in February with completion date Oct. 1, 1961.

Solar's urea unit is to be built under license by Stamicarbon, N.V., a wholly-owned subsidiary of Dutch States Mines of The Netherlands.

The ammonia unit at the Joplin facility of Solar Nitrogen Chemicals, Inc., is now being built by the M. W. Kellogg Co. This unit was started in mid-August this year and is to be completed in April, 1961.

The Joplin facility of Solar Nitrogen Chemicals, Inc., will produce anhydrous ammonia, urea and related products. It will be operated by Atlas. The plant's products will be marketed by the Sohio Chemical Co., which is both manufacturing and sales agent for Solar's similar facility at Lima, Ohio.

Largest Shipment Sails

PHILADELPHIA — The S.S. DeSoto recently sailed with the largest dry cargo shipment from a Delaware Valley plant ever to leave the Port of Philadelphia. Bound for Pusan, Korea, she carried a cargo of six million pounds of urea fertilizer.

Produced at the recently-completed plant of SunOlin Chemical Co., Claymont, Del., the urea was shipped as part of the U.S. government's program, "Hands Across the Sea."

Urea Production Process Announced By Chemico

NEW YORK — Chemical Construction Corp., fertilizer, chemical and petrochemicals plant designer, has announced a new process for the production of urea.

The process employs the principle of carbamate solution re-cycle, which facilitates the complete consumption of the ammonia and carbon dioxide used as raw materials. The operation utilizes only a small quantity of water for the recycle of unconverted ammonia and carbon dioxide. This results in a high concentration of urea product before the evaporation stage, the company says.

The Chemico urea process has a method of conserving the heat that results from its operation, and significantly less steam is required than by other methods, the company says.

Lucien Cook, chief engineer, urea division, stated that Chemico has worked on the technique which results in a marked reduction in initial investment on the part of urea producers, lower utility costs and less maintenance costs.

Also, it provides longer "on-stream" time allowing the plant to run without shutting down for maintenance and adjustments, Mr. Cook said.

The process is being tried by the Cooperative Farm Chemicals Assn., Lawrence, Kansas.

American Potash Announces Expansions

LOS ANGELES—Two major construction projects at American Potash & Chemical Corp.'s sodium chlorate plants were completed recently, announced Peter Colefax, president and chairman of the board.

Production capacity at the firm's Aberdeen, Miss., sodium chlorate plant was increased 50% when an expansion project, begun last spring, went on stream.

Work had been completed on an extensive modernization program involving replacement of the sodium chlorate recovery system at the Henderson, Nev., plant.

The Henderson project, also started last spring, improves process efficiency and product quality, Mr. Colefax said.

U.S. Borax Appointment

LOS ANGELES — Appointment of J. R. Miller to the newly-created position of management science analyst in the administrative department of U.S. Borax & Chemical Corp. was announced by R. F. Steel, vice president in charge of the department.

Mr. Miller joined the company in 1957.

He was graduated from the U.S. Naval Academy with a B.S. degree in engineering and holds an M.B.A. degree from UCLA. Currently, he is continuing work on a doctorate degree in the field of management science.

Elected President

PHOENIX, ARIZ. — Dr. Lemac Hopkins, Glendale, Ariz., manager of California Chemical Co.'s Ortho Division, has been elected president of the Arizona Agricultural Chemical Assn.

Others named at a recent meeting include Ed Abrahams of Olin Mathieson Chemical Corp., Phoenix, vice president and Bill Finch, Arizona manager, Pacific Guano Co., secretary-treasurer.

Other directors named were Harvey M. Bales, Arizona Pest Control; Duncan A. Sim, Southwestern Agrichemical Corp.; M. F. Wharton, Arizona Fertilizer & Chemical Co., and J. Allen White, White Chemical Co.

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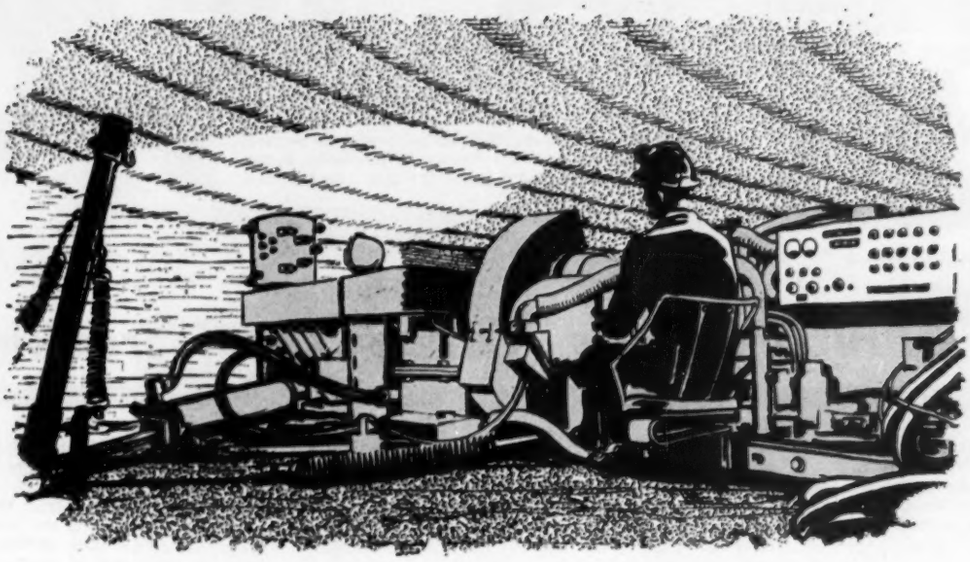

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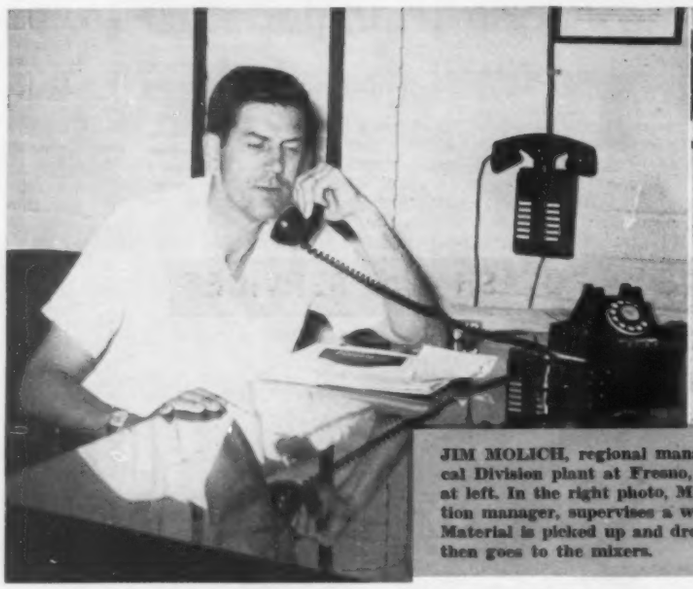
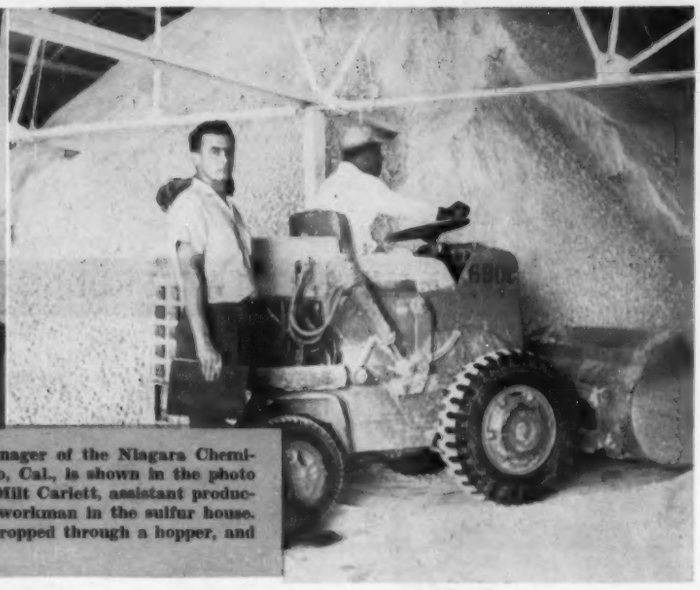




JIM MOLICH, regional manager of the Niagara Chemical Division plant at Fresno, Cal., is shown in the photo at left. In the right photo, Milt Cariett, assistant production manager, supervises a workman in the sulfur house. Material is picked up and dropped through a hopper, and then goes to the mixers.

At California Pesticide Plant . . .

Producers' Problems, New Methods Considered Important

"We try to work closely with producers on their problems and try to keep them informed of new products and methods," says Jim Molich, regional manager of the Niagara Chemical Division pesticide plant at Fresno, Cal.

The plant, where fertilizer is also manufactured, is considered by Niagara as one of its finest facilities. "It has gone through a 24-year period of growth and is still expanding," says Mr. Molich.

The company built the plant originally for the purpose of manufacturing dusting sulfur and alkali neutralizers. Since then, the plant has been modernized until the various crushing and mixing operations are almost completely controlled by electric panel boards.

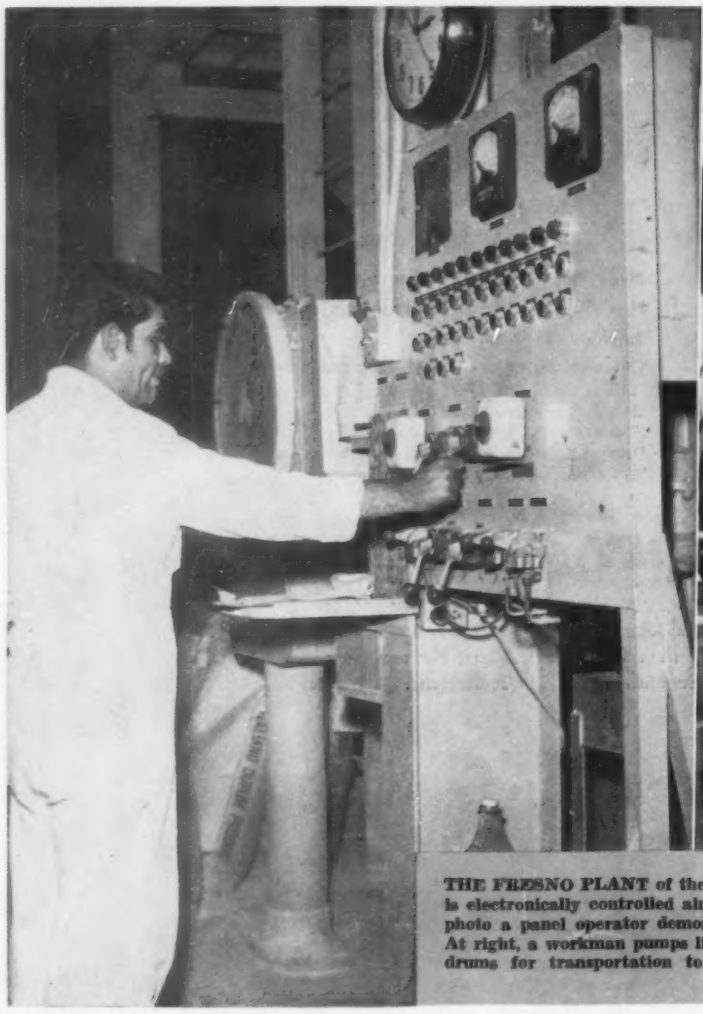
Raw ingredients are shipped in both by truck and rail. In the insecticide plant, the materials are batched into weigh hoppers, then elevated into the mixers. After going through the mixers, the finished product is taken out by a valve bag packer and placed in 50 lb. bags. The maximum capacity of this plant is five tons an hour.

Liquid insecticides manufactured in a separate plant are also automatically controlled, with most of the products being sold in drums. The company also has an increasing trade in small-packaged insecticides, Mr. Molich says.

Sulfur is bought in large quantities to be used in the insecticide and fertilizer manufacture, and also to be sold as a pure product.

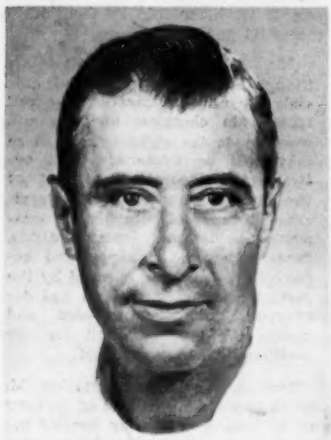
After arriving by rail and transported from the cars by a front-end loader, the sulfur is dumped into a hopper. It then goes to the crusher and is finally elevated into the raw sulfur storage bin. From there it can be taken to mixers for making insecticides or placed in bags.

Products are manufactured under the Niagara label, except for sulfur, seeds and fertilizers, which bear the Sunland brand.



THE FRESNO PLANT of the Niagara Chemical Division is electronically controlled almost completely. In the left photo a panel operator demonstrates various operations. At right, a workman pumps liquid insecticide into 55 gal. drums for transportation to dealers and large farms.

Production MAN of the MONTH



"Tony" Groves

Production of Quality Pesticidal Products Is Texas Operator's Goal

RESPONSIBILITY for the production of quality pesticidal products at the plant of Southwest Sprayer and Chemical Co., Waco, Texas, lies heavily upon the shoulders of Harold L. Groves, better known as "Tony," our choice for "Production Man of the Month."

Quality products have been one of the paramount factors in the success of Southwest Sprayer and Chemical Co. Ever since its incorporation in 1950, the highest quality possible in raw materials has gone into the formulation of its chemical products.

"Tony" Groves is the man who maintains this standard in formulating the "Southwest" brands of insecticides and desiccants. Tony's experience and know-how have enabled him not only to be a "chemical formulator" but also to perform a real service to the farmers.

He personally supervises the operations of the plant at all times, working with his men to insure that every gallon of chemical that bears the "Southwest" label comes up to the standards farmers have come to expect and depend upon from the company. Southwest salesmen use Tony's knowledge to talk with confidence to the dealers and product users.

Before coming to Texas and Southwest Sprayer, Mr. Groves was associated with Sherwin-Williams Co. for five years doing research on insect control at Ohio State University. Prior to this, he served his country in the armed forces from 1941 to 1945.

The ability and dependability possessed by this production man play a vital part in the position Southwest has earned over the past decade.

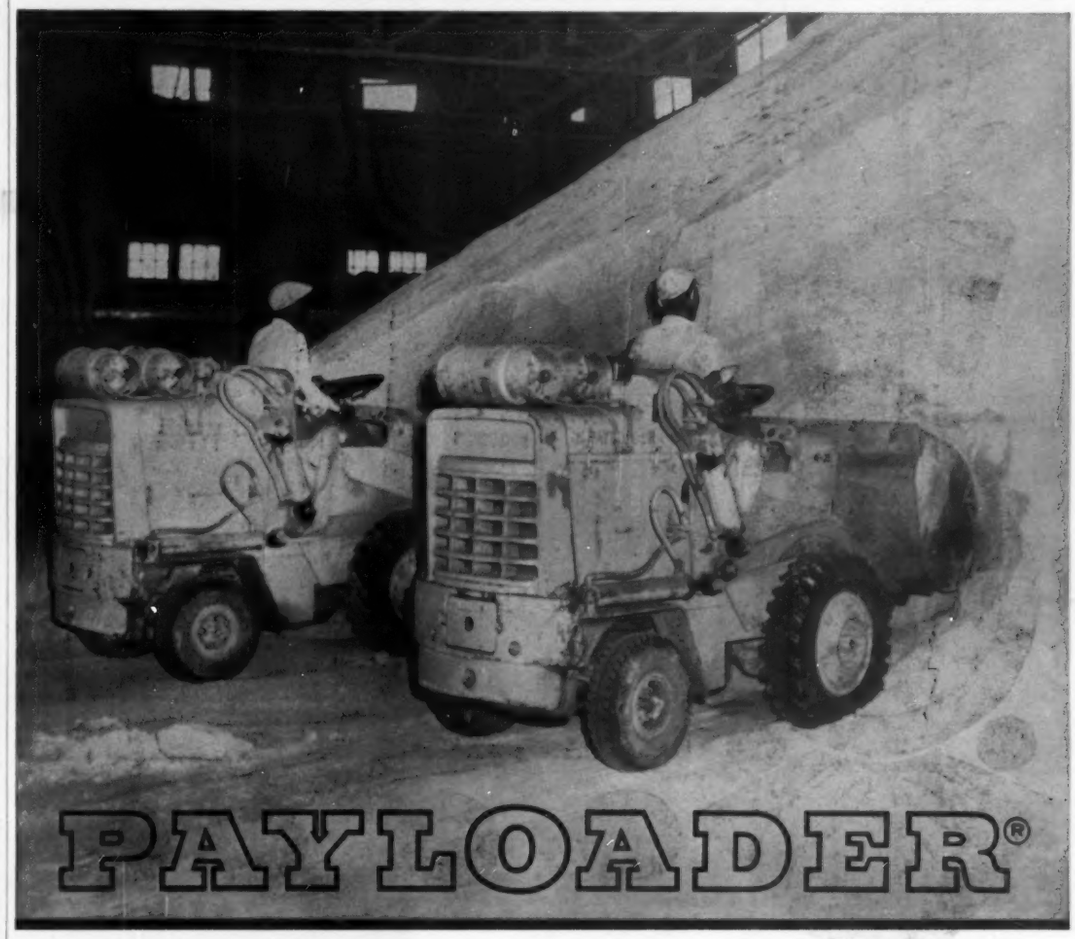
SOLUTIONS OFFICERS

MEMPHIS, TENN.—The National Fertilizer Solutions Assn. elected as president for 1961, Donald Humphrey, Flo-Lizer, Inc., Kingston, Ohio, at the group's recent annual meeting in Memphis. Mr. Humphrey succeeds Hugh S. Surles, Jr., Planters Cotton Oil & Fertilizer Co., Rocky Mount, N.C.

Other officers named at the convention were: Edward O'Nan, Land O'Nan Warehouse, Sturgis, Ky., vice president; Edwin C. Aylward, Aylco Fertilizer Division of Unexcelled Chemical Corp., Sullivan, Ill., secretary; and Edward A. Wex, Badgerland Liquid Fertilizer Corp., Milwaukee, Wis., treasurer.

New directors named were G. C. Matthiesen, Nitrogen Division, Allied Chemical Corp; C. I. Graves, Victor Chemical Works; John Dale, Jr., General Metals Corp; Lewis D. Hart, Sun Gro Plant Food Co.; R. T. Henry, Rainbow Chemicals, Ltd.; John Larkin, Farmers Mill & Seed Co.; W. R. Harrell, Tidewater Chemical Co.; Bryce W. Stracken, Southland Liquid Fertilizer Co.; and Paul C. Hughes, Farmers Soybean Corp.

NEW OFFICERS—Newly elected officers of the Pacific Northwest Plant Food Assn., selected as a highlight of the group's annual convention Nov. 4 in Boise, Idaho are from left: Dick South, Hansen and Peterson, Mt. Vernon, Wash., vice president; Harold Rud, J. R. Simplot Co., Salem, Ore., president; John Wilson, Seattle, Wash., manager, and Art Burkette, Chas. H. Lilly Co., Seattle, Wash., treasurer.



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ROUND TABLE

(Continued from page 1)

and H_2SO_4. Terminology, he said, is confusing with the same things being reported in various manners from various states.

A report on a recent survey on uniformity in the fertilizer laboratory and plant showed further the need for standardization of raw materials and uniformity in nomenclature to cover the complete description of processed raw materials.

According to the survey, the terms moisture value, free acid, particle size, and other considerations need reshuffling so all who deal with these terms will think in the same terms.

Others appearing on the program covered topics concerning particle size of products and problems concerned with uniformity of raw materials from the viewpoint of manufacturers.

Wayne King, W. S. Tyler Co., deplored the differences in terminology used in describing screen sizes of sieves which he said should be uniform but actually are not.

Mr. King reported on the recent U.S. standard sieves adopted this year by the ASTM and the National Bureau of Standards working with the American Standards Assn. and the International Standards Organization. New specifications have been perfected, principal features of which include combination into a single series of the former coarse and fine series having openings in the ratio of the fourth root of two with sieves one millimeter and coarser identified by openings in millimeters, and sieves finer by opening in microns.

Openings in the new series are compatible with the old U.S. series E-11-39 since the basic openings of the sieves have not been changed, Mr. King said. Manufacturing tolerances have been revised to produce sieves of greater accuracy and consistency of results.

Specific nominal wire diameters have been specified to produce a progressive relationship between sieve openings and wire diameters throughout the entire series.

Thus, Mr. King said, in view of the complete compatibility between the U.S. and Tyler sieves, they may now be used interchangeably in making and reporting sieve test results. Heretofore, there have been misunderstandings resulting from differences in specifications between different types of screens. In passing, Mr. King mentioned some of the foibles of the industry's system of measurements and lauded the use of the metric system, which he described as being simple, universally used and understood.

Rodger Smith, Eastern States Farmers Exchange, was first to appear on the users panel. He pointed out that the farmer expects to get full measure in his fertilizer and has a right to expect the NPK content to be as stated on the bag. He described the state control officials as being the "farmers' guardian" and said that these men operating in 47 states try to make sure that every bag of fertilizer sold in their states meets its guarantee.

Mr. Smith indicated that although the fertilizer control officials in all the states are well trained in chemical analysis and want to do the right thing, there may still be numerous gaps between the theoretical content of the fertilizer and actual performance. Because of publicity on occasional deviations from analysis, farmers become unhappy and believe they are being cheated by the fertilizer industry. This is bad for everyone, discourages sales, and makes life more difficult for the fertilizer industry, he said.

Reasons behind this situation, Mr. Smith explained, are lack of uniformity in testing, a similar lack of uniformity in raw materials, segregation in the product, and operating errors.

In order to be on the plus side of the ledger so far as analysis is concerned, the fertilizer manufacturer must average out his product, and this causes financial loss in ingredients used. Over-formulation costs range from $1 to $2 a ton sometimes, and this is too great a charge against the already small profit margin.

The problem resolves to the man in the plant making the product. Too many superintendents still regard the work as an art rather than a science. "The need," Mr. Smith said, "is for specific uniformity, more information and better operations procedures within the plant."

E. D. Kingsbury, Kingsbury & Co., Indianapolis, Ind., suggested that potash could be more dust free for better use in formulating fertilizers, adding that cars of potash should be inspected for dust before being delivered to the manufacturer.

Carrying on the comments of fertilizer manufacturers, E. A. Reichard of Robert A. Reichard, Inc., Allentown, Pa., said that the lack of uniformity in super-phosphate presents a considerable problem to his firm. He said that his company tests trucks and cars and tries to average out the material so as to minimize the formulation problems in holding analyses. However, time does not allow checking all cars of super-phosphate, he said, and this sometimes leads to difficulties on their part.

Potash uniformity, he said, is not too bad from their standpoint.

Other speakers on the panel reiterated somewhat the same idea. Gus Mautner, Baugh & Sons, Baltimore, said the problem of uniformity of raw materials could be improved somewhat and Grayson Morris, of Southern States Cooperative, Richmond, Va., indicated the same, adding that segregation is a big problem with his plant.

W. E. Jones of Northwest Cooperative Mills, St. Paul, Minn., summarized the thoughts of the panel by suggesting that the fertilizer manufacturers and producers of raw materials should have a meeting of the minds as to means of communication and come to a better understanding on what shall be the standards of nomenclature, product analysis, and particle size.

Mr. Jones pointed out that the manufacturers of mixed fertilizers are

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forced by state laws to declare the grade value of the product they make and sell. This is a difficult position in many cases, particularly since the manufacturer is unable to charge for any plant food values above the printed guarantee, and at the same time he is subject to a penalty by law if the analysis should be under the guaranteed analysis.

Producers, on the other hand, operate under a low minimum base which, if exceeded, can be charged at a higher rate. Mr. Jones emphasized that this appears to be an inequitable situation and expressed the hope that producers and users may get together eventually to correct the situation.

Producers Tell All

Producers, too, had their say at the Roundtable meeting. Basic producers of nitrogen products, superphosphate and potash also appeared on the program of both Thursday and Friday, Nov. 3 and 4.

H. H. Tucker, Sohio Chemical Co., Lima, Ohio, and Joseph Sharp, Spencer Chemical Co., Kansas City, told the audience about their respective efforts to maintain uniformity in product and described the types of liquid nitrogen offered to the trade by both companies.

Both speakers indicated that, by and large, similar services and materials are offered by other nitrogen producers and every effort is made to give the liquid manufacturer high quality products for use either as a direct application or as part of mixtures.

Speaking for the producers of solid nitrogen materials were Charles Waters, of the Nitrogen Division, Allied Chemical Corp., and D. F. Sedlack, U.S. Steel Corp. These speakers reiterated what had been said by other nitrogen producers: that every effort is made to supply manufacturers with top quality solid materials for use in manufacturing mixed fertilizers of high analysis. They also indicated a desire to communicate more effectively with manufacturers in the trade and to improve the already high standards.

Manufacturers of single superphosphate, triple superphosphate, ammonium phosphates and phosphoric acid presented their views. Panel members included E. F. Carnell, Davison Chemical Co., division of W. R. Grace & Co., Baltimore; H. P. Tatum, U.S. Phosphoric Products Co.; D. O. Walstad, American Cyanamid Co.; W. W. Harwood, International Minerals & Chemical Corp.; Ray Jones, Armour Fertilizer Co., and Tom J. Pierce, Swift & Co.

Mr. Carnell told the group that specifications from different phosphate firms vary widely, these variations being in analysis, moisture, free acid, trace elements, and particle size. There is a need to standardize categories in phosphate, he said, but this should be based on what the manufacturer's needs are.

Mr. Harwood said the triple superphosphate is a mixture of compounds and variations in shipments are brought about through processing, curing, length and depth of the storage area, and other factors. These, he submitted, are difficult for the producer to control.

Ray Jones of Armour & Co. described moisture variations in superphosphate. He said there are two types of variations—one the day to day variation of run of pile material, and the second, the seasonal variation.

If the manufacturer receiving much material watches closely he is probably able to compensate for some variations in the analysis of super, Mr. Jones said. If a supplier could afford storage facilities to accommodate the entire year's need of super, it would help the situation, but economics are of course against such an investment.

Mr. Walstad used a flow sheet of his company's phosphoric acid plant to show points where samples are taken to keep uniformity even. The flow sheet indicated that samples of ground phosphate rock are taken from the car in transit from the dry plant to the triple superphosphate plant and this analysis is used as a base for analyzing the mixing ratio. He said that the very best equipment available is used in making the analyses and that gauges and meters are checked constantly to assure uniformity.

Mr. Tatum answered a number of questions concerning diammonium phosphate. He said that many have asked about what happens to this material when subjected to high temperatures. Is it stable? Will it melt? Does it remain hard on cooling?

He said that laboratory studies and experience in various plants around the country indicate that diammonium phosphate with a very low moisture content is relatively stable at temperatures up to 275° F.

Successful experiments, he said, have been performed in fully integrated plants and in semi-granular plants wherein the heat load was reduced to a total of 75,000 BTU's per ton of mixed goods.

Mr. Pierce pointed out that phosphate deposits are not always uniform as nature put them in the earth. However, uniformity of size is expected from phosphate suppliers.

Editor's Note

Full reports of the panel discussion on potash from the suppliers' point of view; the panel on preneutralization and the discussion on instrumentation in fertilizer production plants will be presented in our next edition. Subject matter contained in these reports was, in our estimation, too valuable to abbreviate to the degree which would have been necessary to include in this issue. Readers should watch for it in the next edition.

TRAFFIC MANAGER RETIRES

ATLANTA, GA.—George W. Leyhe, traffic manager of Armour Agricultural Co., with headquarters in Atlanta, is retiring after 38 years of service with the company. Mr. Leyhe, a native of Chicago, has been associated with Armour since 1922, and has been traffic manager for 33 years. He was honored by his friends and associates in the transportation industry, at a dinner recently at the Atlanta Athletic Club.

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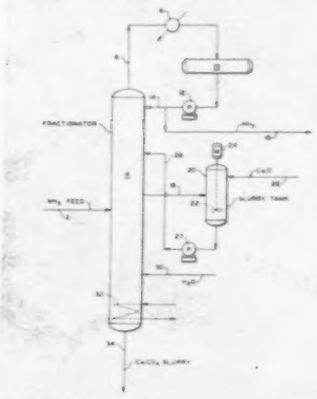
PRODUCTION PROCESS PATENTS

2,955,910

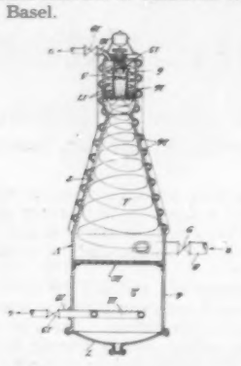
Process for Removing Carbon Dioxide from Ammonia. Patent issued Oct. 11, 1960, to Robert A. Findlay, Bartlesville, Okla., assignor to Phillips Petroleum Co. A process for the separation of carbon dioxide from ammonia which comprises contacting ammonia containing carbon dioxide in a fractionation zone with a compound selected from the group consisting of metal oxides and metal hydroxides of alkaline earth metals whereby the insoluble carbonate of said metal is formed, recovering purified ammonia as overhead product, washing the bot-



tom of the fractionation zone with a wash liquid higher boiling than ammonia and removing metal carbonate slurried in said liquid as bottom from the fractionation zone.

2,955,916

Method of Producing Carbon Dioxide and Ammonia from Intermediate Reaction Products in the Synthesis of Urea. Patent issued Oct. 11, 1960, to August Guyer, Zurich, Ernst Hess, Neuewelt, Fritz Marti, Basel, and Ernst Peterhans and Werner Zollinger, Visp, Switzerland, assignors to Lonza Electric & Chemical Works, Ltd., Basel.



In the treatment of a synthesized aqueous urea solution containing unreacted ammonia and carbon dioxide and intermediate synthesis reaction products, an improved method for dissociating said intermediate reaction products into gaseous ammonia and carbon dioxide and evaporatively separating substantially all of the gaseous and unreacted ammonia and carbon dioxide and a portion of the water contained in said solution while substantially suppressing the formation of biuret comprising: passing said synthesized urea solution at an elevated pressure to a degassing zone of downwardly converging configuration maintained at a lower pressure; tangentially introducing said solution into the upper portion of said zone thereby immediately forming a rapidly rotating descending and converging vortical film of said solution, said solution upon introduction into said zone being cooled by expansion and partial gasification; heating said film of solution along its path of descent by indirect heat exchange to a temperature whereby intermediate reaction products dissociate into gaseous ammonia and carbon dioxide and substantially all of said gaseous and unreacted ammonia and carbon dioxide and a portion of the water are evaporatively separated from said solution; simultaneously with said heating step withdrawing the thus separated gases from the upper portion of the degassing zone; and withdrawing a substantially degassed concentrated urea solution from the lower portion of said degassing zone.

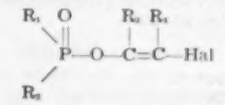
2,955,918

Purification of Phosphoric Acid. Patent issued Oct. 11, 1960, to Robert A. Ruehrwein, Dayton, Ohio, assignor to Monsanto Chemical Co., St. Louis, Mo. The method of removing from phosphoric acid trivalent iron impurities dissolved therein, which method comprises dissolving in said phosphoric acid sufficient chloride ion to obtain at least an 0.1 molar concentration thereof in said acid, contacting said acid with a water-insoluble phosphate ester in a liquid form sufficiently immiscible with said acid and in sufficient amount to form a separate liquid phase in contact with said acid whereby a substantial proportion of said iron in the acid phase is extracted from said acid phase into the liquid phosphate ester phase, and thereafter separating said ester phase from said acid phase.

2,956,073

Insecticidally Active Esters of Phosphorus Acids and Preparation of the Same. Patent issued Oct. 11, 1960, to Richard R. Whetstone, Modesto, Cal., and Denham Harman, Omaha, Neb., assignors to Shell Oil Co., New York.

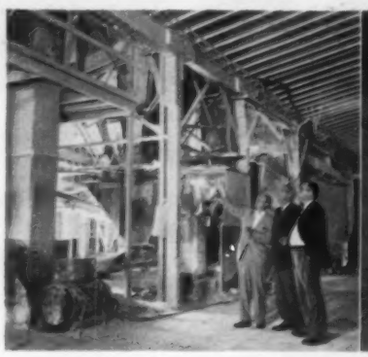
As a novel composition of matter, a compound of the structure



wherein R_1 and R_2 are independently selected from the group of organic

How Sul-Po-Mag® gives Ontario Plant Foods top-quality mixed goods

Sul-Po-Mag gives Ontario Plant Foods' staff more to talk about and sell! Shown on these pages is an example of the way Sul-Po-Mag benefits the customer in all phases of his business. Contact your local IMC district sales manager now to see how the Sul-Po-Mag program can be put to work in your business.



Sul-Po-Mag's outstanding chemical properties include water-soluble ingredients in a form that mixes and blends well, has low salt index and is neutral in reaction. Sul-Po-Mag contains 18.5% magnesia, 22% potash in sulphate form and 22% sulphur.

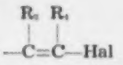
Sul-Po-Mag's excellent physical properties include free-flowing granular form that helps produce a uniform mixed fertilizer. Sul-Po-Mag provides both magnesium and sulphate of potash in one product — a real production advantage.

Sul-Po-Mag is easy to formulate into your fertilizers. It has low chlorine content . . . provides readily available magnesia and potash in sulphate form . . . and is granular to reduce leaching action of soil water.

Completely "packaged" Sul-Po-Mag advertising programs sell farmers on the advantages of using mixed fertilizers containing Sul-Po-Mag. Special Sul-Po-Mag programs are directed to tobacco growers, fruit growers, vegetable growers and general crop producers.

Sul-Po-Mag's personalized merchandising program is imprinted with **your own** brand name. This makes it possible for you to tie in directly with the specific programs in your area.

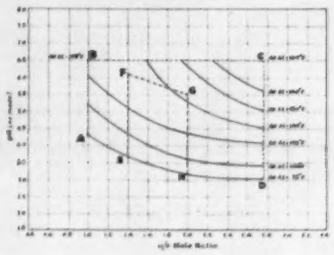
radicals consisting of alkyl, alkoxy, chloroalkoxy, lower alkoxy "Cellosolve" ethers, phenoxychloroalkoxy, aryl, and aryloxy, each of the radicals represented by R_1 and R_2 containing not over 18 carbon atoms, Hal is an atom of halogen selected from the group consisting of chlorine and bromine, R_3 is a member of the group consisting of hydrogen, alkyl radicals, and aryl radicals, and R_4 is a member of the group consisting of hydrogen, halogen selected from the group consisting of chlorine and bromine, alkyl radicals, lower carboxy acyl radicals and carbalkoxy radicals, the group represented by



containing not over 18 carbon atoms. The process which comprises commingling to effect reaction between (a) a neutral ester of an acid of trivalent phosphorus, which ester has directly substituted on phosphorus through oxygen an alkyl group of from 1 to 6 carbon atoms and (b) a halogen-substituted carbonyl compound of the class consisting of halogen-substituted aldehydes and halogen-substituted ketones, having a total of from 1 to 2 aldehyde and ketone carbonyl groups and having directly bonded to the carbon atom of an aldehyde or ketone carbonyl group a saturated carbon atom on which there are directly substituted a plurality of atoms of halogen, whereby reaction is effected therebetween, said atoms of halogen being selected from the group consisting of chlorine and bromine and being the only reacting substituent on the molecule of the said halogen-substituted carbonyl compound, and said neutral ester being free of reacting substituents, and recovering the phosphorus-containing reaction product.

2,955,930

Urea-Formaldehyde Polymers of High Agronomic Value. Patent issued Oct. 11, 1960, to Joseph P. Kealy, Lansing, Ill., assignor to Swift & Co., Chicago.



A process for the manufacture of a urea-formaldehyde condensation product in the presence of a substantially dry fertilizer solids substrate which comprises: contacting said urea and said formaldehyde in the presence of said fertilizer solids substrate at a pH of between about 4.15 and 5, said urea and said formaldehyde being present in mol ratios of between about 1.7 and 6.7 mols urea to 1 mol formaldehyde; cooling the mixture so formed within about 24 hours to a temperature less than about 100° F. and contacting said mixture with sufficient additional formaldehyde to adjust the urea to formaldehyde mol ratio to between about 1.0 and 2.75 mols urea to 1 mol formaldehyde; and allowing said mixture to cure whereby to produce a mixed chemical fertilizer having a urea-formaldehyde condensation product as a source of water-insoluble nitrogen, said urea-formaldehyde product having a water-insoluble nitrogen availability index of at least about 40.

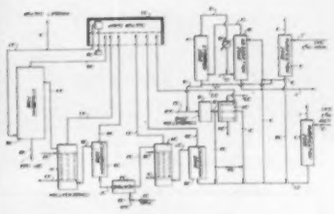
2,955,919

Stabilization of Phosphoric Acid. Patent issued Oct. 11, 1960, to Joseph F. Wilson, Bartlesville, Okla., assignor to Phillips Petroleum Co. A method for treating crude wet-process phosphoric acid containing normally incident impurities which precipitate as solids, which method comprises adding to said acid a polymer in an amount sufficient to inhibit said precipitation, said polymer being prepared from a heterocyclic nitrogen base monomer containing the

group where R is a member selected from the group consisting of hydrogen and methyl radicals.

2,958,586

Process for Producing Sulfur from Acid Gases. Patent issued Nov. 1, 1960, to Franklin T. Barber, Bartlesville, Okla., assignor to Phillips Petroleum Co.



A process for producing sulfur from a low-H_2S gas containing from 10 to 70% of hydrocarbons and a high-H_2S gas containing less than 10% of hydrocarbons, which process comprises removing at least part of the hydrocarbons from at least part of said high-H_2S gas to obtain a hydrogen sulfide concentrate, oxidizing the hydrogen sulfide in said concentrate directly to sulfur dioxide, admixing said sulfur dioxide with said low-H_2S gas in an amount corresponding to a molar ratio of H_2S to SO_2 of 2:1, reacting the admixture at a temperature in the range 350 to 700° F. in the presence of a bauxite catalyst to produce elemental sulfur, and recovering said elemental sulfur.

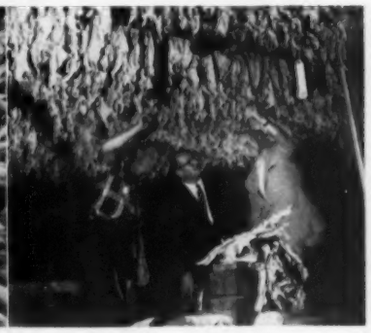
2,958,589

Process for the Production of a Cooled Ammonium Nitrate Product. Patent issued Nov. 1, 1960, to Oliver Lloyd Hayes, Sterlington, La., assignor to Commercial Solvents Corp., Terre Haute, Ind. A process for the production of ammonium nitrate prills of predetermined size which comprises spraying molten substantially anhydrous ammonium nitrate into a prilling tower through which an updraft of air is passed and spraying water droplets onto the descending molten ammonium nitrate to reduce the temperature of the said molten ammonium nitrate to not below 250° F. and without increasing the water content of the ammonium nitrate above 0.4%, and recovering the substantially anhydrous ammonium nitrate prills.

Here, Tom Bruns, IMC's district sales manager (left) discusses the Sul-Po-Mag success story with George Roe, general manager, and Michael G. Demaiter, president, Ontario Plant Foods, Delhi, Ontario. Tom explains how Sul-Po-Mag helps produce premium-quality Gro-Gold fertilizers.

1700-lbs.-per-acre yield on 70 acres — that's what Albert Cloet, Waterford, Ontario, got with recommended applications of Gro-Gold with Sul-Po-Mag. The essential magnesium and the premium potash in mineral-rich Sul-Po-Mag assure optimum yield and quality of this crop.

Grew a bumper crop, got top price at the cannery — reports sweet corn grower John W. Lee, Waterford, Ontario. He applied Sul-Po-Mag direct, 250 lbs. per acre. Here, George Roe explains to Mr. Lee how the magnesium, potash and sulphate in Sul-Po-Mag helped his crop mature early and boosted quality.



Top-quality tobacco leaf — 1700 lbs. per acre — is the success story from George Braun, Delhi, Ontario. He "fed" 80 acres of flue-cured tobacco with Gro-Gold containing Sul-Po-Mag. Here, Ontario's Roe and IMC's Bruns check leaf quality to verify Gro-Gold and Sul-Po-Mag performance.

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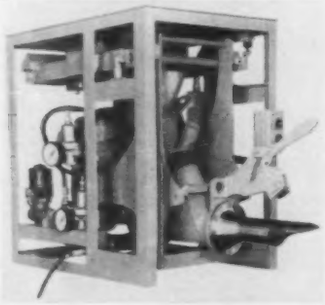
No. 9277—Valve Bag Packer

A multiwall valve bag packer, designed for easy installation and weight accuracy, has been announced by St. Regis Paper Co. Two models are available—the "Easiflow-I" for



granular free-flowing materials, and the "Easiflow-II" for powdered dusty materials. These screw packers provide accurate weighing, low headroom requirements, uniform product flow and dust-free operation, the company says. They are designed for the filling of 25 lb. and 50 lb. bags. Up to four bags a minute can be packed on either machine, depending on product characteristics and density. For details, check No. 9277 on the coupon and mail.

No. 9276—Equipment Bulletin

Edw. Renneburg & Sons Co. announces the availability of a 16-page "Processing Equipment" bulletin. The bulletin illustrates and describes dryers, calciners, kilns, coolers, coaters, spheroidizers, flash drying equipment, refractoryless furnaces, combustion equipment, air handling systems, air pollution control systems, cookers, digesters, granulators, mixers, pug mills, presses, extractors, counter-current washers, pilot plant units, reactors, roasters, distillation towers and other specialized machinery. Included are more than 75 photographs, plus a number of drawings and diagrams. For copies, check No. 9276 on the coupon and mail.

No. 9279—Bucket Elevator Catalog

Publication of a catalog on bucket elevators, complete with all specifications, has been announced by the Andrews Machine Co. The catalog covers both belt and chain elevators in single and double casing design. Three standard series are included in a range of capacities from 280 to 8,835 cu. ft. an hour. In addition to all standard dimensions and specifications, complete formulas are furnished to determine variations that may be desired to meet special requirements. Recommendations are given on types of elevators best suited for the handling of 65 different materials. Step-by-step information is given on determining general elevator requirements, selecting the proper specifications and pricing the complete elevator. For copies, check No. 9279 on the coupon and mail.

No. 9281—Safety-Relief Valves

A series of safety-relief valves for refinery, chemical processing, power plant and general services, has been announced by Farris Engineering Corp. The series provides precise blowdown ring control for gases and

vapors, and safety relief for liquids in a wide range of applications where maximum pressure is 300 psi, the company says. The series has a one-piece stainless steel body and stainless steel disc which contains inlet pressure without other joints or gasketing. This construction provides a leak-proof seat that eliminates waste and corrosion problems, the company says. Full information can be obtained by checking No. 9281 on the coupon and mailing.

No. 9285—Fertilizer Plant Brochure

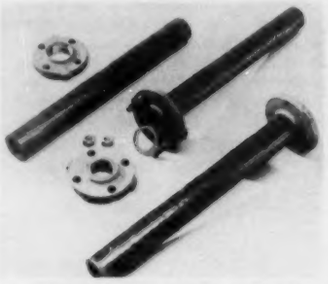
The J. C. Carlile Corp. has issued two brochures on fertilizer plants. One, entitled "Aqua Ammonia Converters and Plants," includes information on process design, equipment, engineering layout prints, prices, operating instruction, performance charts and other subjects. The other, called "Neutral Solution Fertilizer Plants," carries information on plants utilizing the Carlile process, with explanatory information on fertilizer technology. Copies of either brochure are available by checking No. 9285 on the coupon and mailing.

No. 9286—Roof Ventilators

Solid plastic roof ventilators for removing corrosive fumes have been announced by Heil Process Equipment Corp. The upblast discharge blows the fumes high into the air, the company says, minimizing corrosion to nearby roofs and ground areas, and reducing chances of fumes re-entering the plant. All exposed parts including the housing and impellor are built of plastic. There are 10 standard sizes from 400 c.f.m. to 15,000 c.f.m. For details, check No. 9286 on the coupon and mail.

No. 9282—Plastic Pipe

A line of reinforced furane plastic pipe, designed for use in the processing and transferring of acids, alkalis and solvents has been announced by



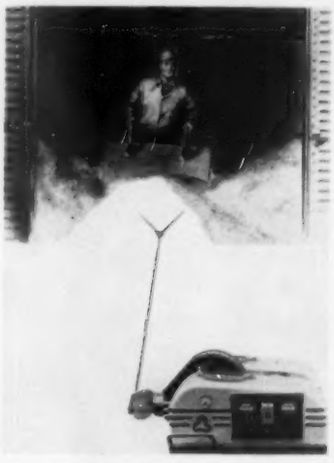
Cornelius A. Rauh & Associates, Inc. Called "Eonite," the chemical-resistant pipe is dimensionally stable and can carry, without distortion or deterioration, hot corrosive liquids and gases at temperatures up to 300° F., at pressures up to 150 psig, the company says. Complete information is obtainable by checking No. 9282 on the coupon and mailing.

No. 9284—Equipment Catalog

The availability of a two color, four-page illustrated catalog of materials handling and processing equipment has been announced by the Young Machinery Co., Inc. Shown and described are company pneumatic conveying systems and components such as pumps, blowers, feeders and cyclones; horizontal mixers; knife cutters; saw tooth crushers; gyro sifters; attrition mills, hammermills, and pulverizers. For copies, check No. 9284 on the coupon and mail.

No. 9287—Materials Handling Unit

Burrows Equipment Co. announces the "Elba Winchdozer" for moving all types of bulk materials. According to the company, the unit will allow one man to move 40 to 60 tons an hour, or to unload a box car or any other bulk moving job without assistance. The operator places the



scoop behind the bulk material to be moved and presses the switch. The winch then pulls the scoop in the desired direction. The operator has complete control at all times, the company says, to start and stop the winch and scoop. The electro-magnetic clutch in the winch responds to the controls in the handle of the scoop. For details, check No. 9287 on the coupon and mail.

No. 9278—Corrosion Resistance Chart

A four-page corrosion resistance chart J-CRC is available from OPW-Jordan Corp. The chart lists more

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Send me information on the items marked:

- ☐ No. 9276—Equipment Bulletin
- ☐ No. 9277—Valve Bag Packer
- ☐ No. 9278—Corrosion Resistance Chart
- ☐ No. 9279—Bucket Elevator Catalog
- ☐ No. 9280—Booklet on Hazards
- ☐ No. 9281—Safety-Relief Valves
- ☐ No. 9282—Plastic Pipe
- ☐ No. 9283—Sewing Pedestal
- ☐ No. 9284—Equipment Catalog
- ☐ No. 9285—Fertilizer Plant Brochure
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- ☐ No. 9287—Materials Handling Unit
- ☐ No. 9288—Pump Bulletin

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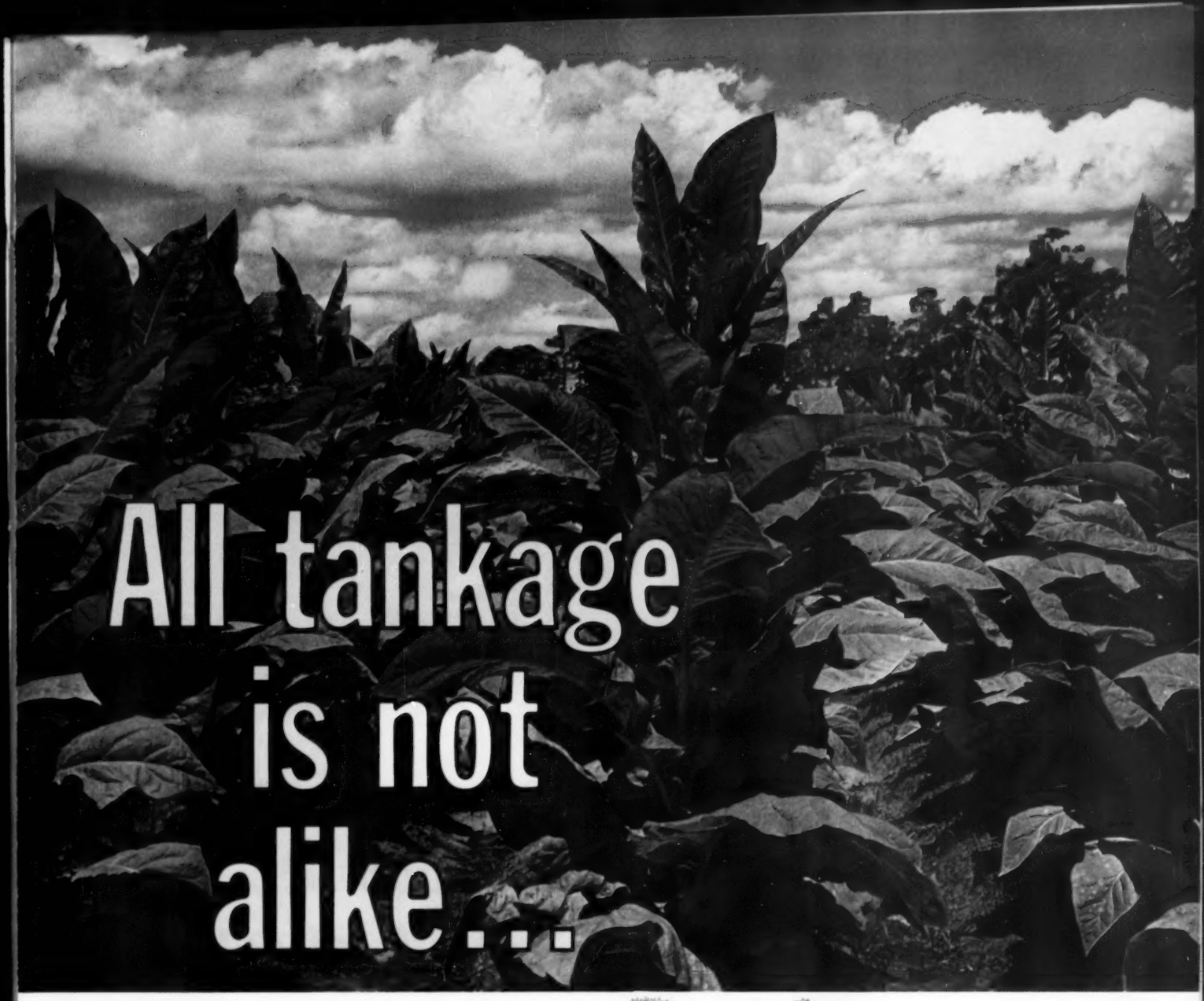


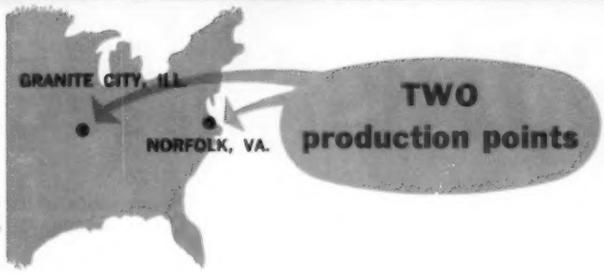
All tankage is not alike...

Natural organics in SMIROW tankage will grow tobacco like this . . . with smooth, even texture . . . well-filled out leaves from top to bottom.

Smirow

has these advantages:

- Eliminates fire hazard • 100% organic
- Faster service from two production points
- Continuous supply will reduce expensive inventory • Uniform in color and texture
- Prevents allergy-dust problems



Natural organic nitrogen is nature's own way of supplying nitrogen to plant life. Don't cut the quality of your organic nitrogen in premium grades of mixed fertilizer.

USE SMIROW—THE PROVEN BETTER SOURCE OF ORGANIC NITROGEN

Be *sure* your tankage requirements will be filled. Let us figure the cost of SMIROW delivered to your plant . . . from either Norfolk, Va., or Granite City, Ill. Faster service to tobacco and citrus belts from the two closest major production points.

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Largest and oldest producer of quality nitrogenous tankage in the United States

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More crates of quality fruit . . . more pounds of solids . . .

Citrus thrives on SMIROW

In mixed fertilizer or applied direct, SMIROW provides long, continuous feeding to citrus. Not a synthetic, but 100% natural organic—SMIROW allows controlled release of plant nutrients.

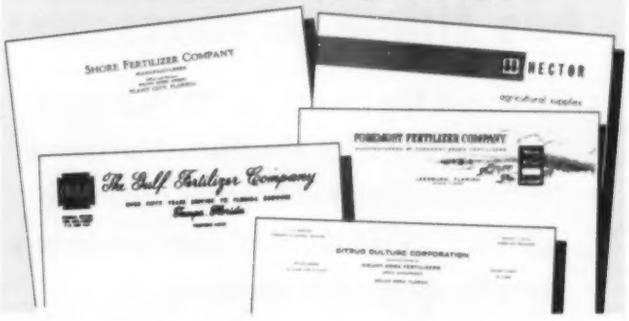
Order SMIROW for your citrus fertilizer and get these extra benefits:

- Eliminates fire hazard • 100% organic
- Faster service from two production points
- Continuous supply will reduce expensive inventory • Uniform in color and texture
- Prevents allergy-dust problems

Be sure your tankage requirements will be filled

Let us figure the cost of SMIROW delivered to your plant . . . from either Norfolk, Va., or Granite City, Ill. . . . two locations convenient to tobacco and citrus areas.

Each year, more and more fertilizer manufacturers use SMIROW natural organic nitrogen.



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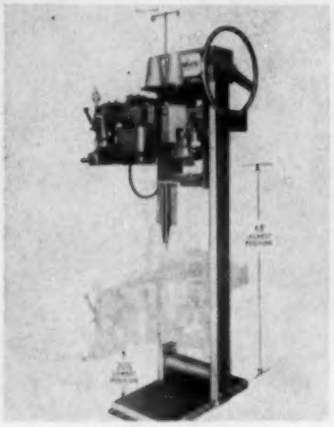
than 150 different chemicals and their recommended usage with ductile iron, iron, steel, 316 and 304 stainless steel, monel, brass, bronze, copper, aluminum and plastisol plastic. The chart also shows which gasket materials are needed for the various chemicals when "Kamlok Quick Couplers" are used and which O-ring materials are needed when swivel joints are used with these chemicals and compounds. For copies of the chart, check No. 9278 on the coupon on page 10.

No. 9283—Sewing Pedestal

A sewing pedestal has been announced by Richardson Scale Co. which will adjust vertically and horizontally to suit various bag heights and widths, different sewing heads, filter cords and tape sealers, eliminating the need for a two-headed pedestal in bag-filling operations. The pedestal has a range of adjustments including needle height from 20½ in. to 48 in. Horizontal adjustment ranges from 19 in. to 27 in. Raising and lowering the head is accomplished by turning a hand wheel. The head can be positioned exactly where needed, the company says, with zero backlash. It uses no counterbalance weights or springs. For details, check No. 9283 on the coupon on page 10.



No. 9288—Pump Bulletin

A bulletin on horizontal split case pumps for water and clear liquid transfer has been announced by the American Well Works. The bulletin covers company's 400 single stage and 4400 two stage centrifugal pumps used in industrial plants and other applications. It includes cutaway illustrations, specification data, dimensional drawings and tables, and installation photos. For copies, check No. 9288 on the coupon on page 10.

No. 9280—Booklet on Hazards

Foster D. Snell, Inc., announces a booklet discussing the measurement, detection, correction and litigation of casualty, fire, pollution and product-liability hazards. The booklet stresses prevention of these hazards by means of plant appraisals, precautionary labeling, toxicological testing and so on. It also emphasizes the need for promptly calling in an expert in the investigation of industrial accidents when a mishap occurs. Copies of the booklet, which was written for plant safety officers, engineers and management interested in avoidance of accidents, can be obtained by checking No. 9280 on the coupon on page 10.

FERTILIZER EXECUTIVE DELAWARE GOVERNOR

WILMINGTON, DEL. — Elbert N. Carvel, president of the Valliant Fertilizer Co., Laurel, Del., was elected governor of Delaware in the election of Nov. 8.

Mr. Carvel, who previously served one term as governor from 1948 to 1952, defeated the former Lt. Gov. John W. Rollins by 6,884 votes. The unofficial tally was 100,537 to 93,563.

Mr. Carvel, a Democrat, is also board chairman of the Milford Fertilizer Co., and operates three farms in Delaware and Maryland. He is also a former lieutenant governor.

TROUBLE-SHOOTING

IMC Technical Service solves fertilizer industry problems in the office... in the plant... in the lab... in the field.

From the files of IMC's Technical Service comes this case history that illustrates the range of IMC's concept of technical service—creative technical assistance that begins at the ground and continues through every phase of production.

From disaster, a sheaf of marketing, labor and manufacturing data emerges to guide IMC planners and local plant officials in reconstructing facilities to match potential.

your toughest problems

IMC tech service reps are trained, equipped, dedicated to solving hundreds of manufacturing problems each year. They're men on-the-go, interested in serving you better!

Your IMC tech service man knows what an inaccurate meter calibration can cost you . . . he knows and understands the importance of peak production throughout the rush season — and that a plant shutdown of only a few hours can cut heavily into your year's profit. He is a fertilizer man by experience and training. He has the know-how to pitch in and help — not only in the problems that occur, but also in seeking out and preventing trouble before it happens. Here's how IMC tech service has helped just a few customers:

Ontario — Subject company was starting up a new plant. IMC's Johnson and Franklin assisted in the original installation of equipment. The plant was put on stream and the customer went into immediate continuous production using IMC's formulations.

Florida — Subject company requested help in the granulation of X-O-X grades using Sul-Po-Mag. Mr. Causey was dispatched to assist in the proper production of this product.

Arkansas — Subject company was almost completely destroyed by fire. On Monday, IMC Technical Service was requested to assist in engineering and rebuilding the plant. On Friday, Mr. Robert Heck presented the customer with completed preliminary layouts.

Iowa — Subject company requested immediate engineering assistance for construction of a second shipping mill including simultaneous operation of bagging fertilizer and loading bulk trucks. IMC's De Long, with the assistance of IMC engineering, prepared completed drawings for this installation in one week's time.

Use the extra knowledge, the new ideas, the cost-cutting techniques which IMC can bring to bear. Your IMC technical service man concentrates on total service. Can he help you?

Now—Technical Training Offered to IMC Customers

Due to repeated requests from our customers, IMC has initiated a program on some of the most troublesome technical problems confronting fertilizer manufacturers.

Formulation, mechanization, maintenance and trouble-shooting are all part of this practical meeting agenda. Day-to-day problems and their solutions are currently being discussed in 11 cities throughout the country.

Plan to attend the IMC Technical Training Meetings — one of which will be close to your city. Check below for times and places.

CITY	DATE
Minneapolis, Minn.	Monday, Tuesday, October 24, 25
Indianapolis, Ind.	Wednesday, Thursday, October 26, 27
Baltimore, Md.	Wednesday, Thursday, November 9, 10
New York, N.Y.	Monday, Tuesday, November 14, 15
Raleigh, N.C.	Wednesday, Thursday, November 16, 17
Toledo, O.	Monday, Tuesday, November 21, 22
Winter Park, Fla.	Monday, Tuesday, November 28, 29
Montgomery, Ala.	Wednesday, Thursday, November 30, December 1
Kansas City, Mo.	Monday, Tuesday, December 5, 6
Tyler, Tex.	Monday, Tuesday, December 12, 13
Jackson, Miss.	Wednesday, Thursday, December 14, 15

AGRICULTURAL CHEMICALS DIVISION

INTERNATIONAL MINERALS & CHEMICAL CORPORATION

ADMINISTRATIVE CENTER, OLD ORCHARD ROAD, SKOKIE, ILLINOIS, ORCHARD 6-3000

IMC

PRODUCTS FOR GROWTH*

*TRADEMARK

Translated into preliminary designs, this data is creatively interpreted into smooth-running production methods by IMC experience and made consistent with available building budgets.

In the actual construction, IMC technical personnel are "on site" to further extend technical aid, interpret intricate installations and define production and architectural ideas.

FO-3-01

Fertilizer Technology Changes To Meet Agricultural Demands

By RODGER C. SMITH*

Head, Fertilizer Research
Eastern States Farmers' Exchange, Inc.
West Springfield, Mass.

CHANGES toward a more stable agriculture, fewer farms but more acres per unit, the rising population, and the continuation of research for more efficiency on the farm, all point to improvements in fertilizer industry technology and to the need for more modern production methods for fertilizers.

A review of facts and figures illustrating our changing agriculture will help to see more clearly the market we are serving. State control officials, and those of us employed in the fertilizer industry jointly serve this market—this changing agriculture.

Of pertinent interest is the fact that farmers are calling on the fertilizer industry to serve them more fully, as well as in greater quantity of material. Remember the picture of farming today—more production on fewer farms with less labor. The farmer wants and needs fertilizers that more adequately meet the nutritional needs of his crops, that reduce his labor, particularly at peak work periods and that continue to offer the opportunity for high return on investment. Following are a number of the ways in which fertilizer technology is meeting this challenge.

Ingredients being made available by the chemical industry for mixing or direct application are substantially improved. The nitrogen in mixed fertilizers is derived largely from nitrogen solutions. The number of formulations have been increased in recent years to better meet specific needs. Solutions are available with relatively low amounts of ammonia making it possible to derive a larger portion of the nitrogen in a mixed fertilizer from low-cost solutions without excess ammonia to react with either superphosphate or an acid.

The amount of water contained is reduced, usually by the inclusion of a small amount of urea which, in combination with ammonia nitrate, changes the solubility characteristics. A commonly used solution is composed of 20% ammonia, 68% ammonium nitrate, 6% urea, and 6% water. The tremendously increased production of urea is noteworthy with increased availability and lower delivered cost.

An important development and what may prove to be a decisive change in the industry is the production of ammonium phosphates, either mono, di, or a combination of the two. These materials being available in uniformly granulated form at reasonable cost enable increased concentration of mixtures, dry blending, and an assist to granulation. Announcement of commercial production of potassium nitrate at Vicksburg, Miss., in about one year heralds a similar step forward in combining two nutrients into one ingredient having superior qualities technologically and agronomically. These may prove to be the forerunners of other ingredients having two or more nutrients. Indeed they may lead to expanded production of so-called complex fertilizers in the U.S. Such has been the situation in Europe.

Wet process phosphoric acid has been manufactured for years by triple superphosphate manufacturers for in process use. A natural development in mixed fertilizer granulation has been the substitution of phosphoric acid for sulfuric acid to react with ammonia. Increased concentration, lower cost mixture, better granulation and less formation of noxious gases of nitrogen compounds occur. Phosphoric acid producers have made their product more usable for this purpose by increasing concentration, usually to 75% acid, and by further removing the precipitates—calcium, iron and aluminum phosphates. Some furnace grade phosphoric acid is used in granulation, but it is too costly at most locations.

The term "superphosphoric acid" is gradually becoming more commonly spoken. It is a mixture of ortho and polyphosphates having a P_2O_5 content usually of about 76%. This concentration is dictated largely by a favorable dip at that concentration in the crystallization temperature. The manufacture of this acid and its utilization in both solid and liquid fertilizers have been explored by the Chemical & Development Branch of TVA. Although posing some corrosion and handling problems, it offers distinct advantages which are likely to cause it to become commercially used. One likely use is the production of 52% triple superphosphate.

Another type of development is materials providing controlled rate of solubility. You are familiar with urea-form. Considerable work is under way on methods of reacting urea and formaldehyde. Although urea-form is now largely restricted to specialty uses, economies in methods of incorporating urea-form-type compounds may permit a wider range of uses in the future. Magnesium ammonium phosphate is another compound having slow rate of solution.

Each of these developments in materials is an example of how the chemical industry is becoming an increasingly effective hired hand on the farm. With the probability of obtaining about $3 return for each $1 invested in fertilizer, the associa-

(Turn to TECHNOLOGY, Page 24)

*Part of a speech presented by Mr. Smith at the Association of American Fertilizer Control Officials, Washington, D.C., Oct. 14, 1960.

Market
more profitable
fruits and vegetables...

protect them
with Penick's

POWDERED CUBE!

Because of its outstanding safety and effectiveness, Penick's powdered cube continues to enjoy wide popularity as a general-purpose agricultural insecticide dust.

It effectively controls vegetable weevil, Japanese beetle, raspberry cane borer and many other chewing and sucking insects. Penick's powdered cube won't injure fruits and vegetables and may be used within days of harvest without fear of harmful residues.

Penick's complete line of rotenone formulations includes brittle extract of cube, emulsifiable rotenone 5%, and many special concentrates.

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Arcadian® News

Volume 5 | For Manufacturers of Mixed Fertilizers | Number 11

Is Your Plant Ready To Operate on Schedule?

IT PAYS TO CHECK YOUR EQUIPMENT

Now is the time to make sure that your plant is in shape for continuous operation throughout the fertilizer production season. By checking your methods and equipment now you can help to avoid breakdowns, replacements, and other interruptions in output of fertilizer during the height of the season.

It is easier to avoid trouble than it is to correct it after it has occurred. Improvised repairs in mid-season are often followed by recurrence of the same production problems causing more delays. Too many of these delays can add up to a low output of tonnage at the end of the season. Here are some suggestions which may help you to keep your plant operating after a smooth start:

Keep Accurate Records

Failures of heavy equipment can be a serious problem. Parts, such as elevator chains, sprockets, gears, pinions, and bearings, are exposed to heavy strains, abrasion and corrosion. They should start the season in top-notch condition.

Keeping good records on the age and use of parts will help to indicate needed replacements. Squeezing a little more service from parts of doubtful vintage is often a costly procedure in many ways. Some times it takes quite a while to obtain new parts. For example, properly matched sets of large V-belts are often not readily available.

Inspection Needed Now

Now is the time to check specifications to avoid overloading belts, gears and chains. Also check the conditions and suitability of all fuses, overload releases, shear pins, pressure and vacuum relief valves, and pressure regulators. *Do not use the pressure regulator or the governor as safety valves.*

Plants, too small to employ specialists, sometimes have arrangements with local electricians, pipe fitters and machine shops to promptly handle emergency repairs. Inspections made now by these skilled men may avoid expensive breakdowns and shutdowns later. Equipment manufacturers often will oblige with inspections of their equipment to assure continued satisfactory performance.

Metering and Weighing

The accuracy of your operation is determined by your scales, meters and measuring tanks. Proper functioning of these metering and weighing devices can greatly influence your profit and loss picture. It pays to be certain that they are accurate.

Have on hand (with gaskets) spare glass metering tubes calibrated for all liquids they are likely to meter. Also, have spare glass tubes for measuring tanks and provide for frequent and thorough cleaning of *all* gauge glass connections. Be sure that all measuring devices are of ample capacity because bottlenecks here are drags on production.

Air Systems

In automatically-regulated air compressors, when the "ON-OFF" range is too limited, there is a strong probability that the unit is not delivering to maximum capacity and the motor may overheat. If the "OFF" pressure is too near the operating pressure, the receiver tank cannot function properly, because it does not build up a reserve capacity during low demands of operation. Always have the process air well below the safe range of all equipment and do not trust any pressure regulator or governor to double as a safety valve.

Make sure you have adequate air pressure in all tanks before starting the day's operations. Learn how long it takes to build up pressures at different liquid levels in the tanks.

Avoid High Pressures

If a centrifugal pump is not delivering sufficient volume, this may be caused by excess pressure on the pump's outlet. At

30 pounds pressure, the pump may deliver only half as much volume as at 25 pounds pressure, and may deliver nothing against 40 pounds pressure. The application of only a little air pressure at the pump's supply tank will usually correct the problem.

Avoid high pressures on centrifugal pumps. The system should be protected against excess pressure when positive displacement pumps, such as the piston or gear types, are used. All pumps are sensitive to vapor locking from air or gas. This problem should be suspected when any pump is handling any volatile liquid at temperatures that approach its boiling point.

Cold Weather Operations

Certain precautions are required in handling nitrogen solutions during cold weather, due to their tendency to "salt out" and block equipment when the temperature goes low. "Salting out" is easy to prevent, especially when the solution moves through short, well-insulated piping direct from insulated tank cars fresh from the nitrogen producer's factory.

If circumstances require operating below the specified "salting out" temperature of the particular nitrogen solution, a few simple safeguards may avoid serious consequences.

When the solutions arrive at your plant, have everything else in the process ready and waiting for the flow of the solutions to start and continue uninterrupted at normal rates.

For insurance, pour a few gallons of hot water over the valve at the tank car or storage tank to dissolve any salts that may block the valve. Then promptly open the valve wide and start operation.

For any prolonged shut-down, force the solution back into the tank and close the valve tightly while the air is passing through it, or drain the piping in any other fashion. For longer shut-down, disconnect the hose at the car to prevent filling the piping through leakage. Provision for similar tactics should be made at the storage tank.

Choose the Right Solution

Select the proper ARCADIAN® Nitrogen Solution for your particular requirements and prepare your equipment to extend its use right down to the temperature limitations.

Every precaution should be exercised to avoid blocking the piping with nitrogen salts. If this should occur, *never* use heats greater than those of boiling water or low pressure steam to re-dissolve the salts. Pipe joints at frequent intervals will facilitate this freeing operation. Avoid all possible pressure build-up while applying heat.

Air Line Problems

In cold weather, there is usually more difficulty with the air supply than with nitrogen solutions or acids. Where there is compressed air, there is water. Much of the water is condensed in the air receiver and this tank should be drained each day during cold weather. There are many good filters which will remove most of the moisture from the air before it enters the piping. However, enough moisture does enter the piping to create a serious freezing hazard.

To minimize this hazard, air lines should have a marked slope to some convenient receptacle for draining the accumulation of moisture. Frequent drain points in the air piping are highly recommended.

Some states outlaw the injection of alcohol into the air system and insurance companies take a dim view of this practice. In any event, no inflammable material should be injected into a high-pressure air system because it can cause an explosion.

The high heats of torches for thawing frozen air lines may be hazardous because steam can be pocketed at dangerous pressures. Where the air line is near the nitrogen solution piping, extreme care should be exercised in using high temperatures for thawing the air line.

Metering in Cold Weather

The specific gravities of the following ARCADIAN® Nitrogen Solutions increase about 1% for each 29°F. drop in temperature of the liquid: NITRANA® 2, 2M, 3, 3M and 7; URANA® 10, 12 and 13. Corresponding figures are 27°F. for NITRANA 6; 33°F. for NITRANA 4 and 4M; 50°F. for U-A-S® A; and 22°F. for U-A-S B.

It is well to consider compensating for the change in specific gravity for Anhydrous Ammonia, for it increases about 1% for each 6°F. drop in its temperature.

The viscosities of the above nitrogen solutions and of anhydrous ammonia are so low at all operating temperatures that no known meter is adversely affected. In changing the settings for flow meters to accommodate changes in specific gravity, note particularly that this is not a direct function of the two specific gravities.

However, the viscosities of some acids are severely influenced and these factors should be taken into account when they are being metered.

When you need technical assistance, contact Technical Service, Nitrogen Division, Allied Chemical Corporation.

Polyethylene Pipe Resists Corrosion in Liquid Lines

The outstanding chemical resistance of polyethylene pipe to most of the conditions of fertilizer manufacture makes this inexpensive plastic pipe worthy of consideration for use in liquid lines for corrosive materials.

Polyethylene is classified somewhere between rigid and non-rigid plastics. It is fabricated into many pipe sizes suitable for various pressure requirements. The common 1½ inch pipe size is available in pressure ratings from 75 to 150 pounds at 75°F. The higher molecular weight polyethylene and extrusion methods in use today permit polyethylene pipe to retain most of its strength in surroundings somewhat above 75°F. It is wise to separate or insulate it from steam pipes, hot water lines, or hot roofs.

Since polyethylene pipe is shipped in coils up to 100 feet in length, an installation may often be made with only two or three joints up to the meter or batch tank. Heavy wall pipe needs support only every six or eight feet, while the thinner 75-pound pipe requires much closer support—approximately every two feet. This thin pipe is often strapped down on a wood 2" x 4" fastened to wall studs or along a cement block wall.

Different Sizes Needed

The thin 75-pound pipe should be used only for the ammoniating solutions within this pressure range. For acids and nitrogen solution having the higher vapor pressure, the 100-pound pipe should be regarded as the minimum. Most acid is moved by pumps and these should be operated well below this pressure. The 1½ inch 100-pound polyethylene pipe costs about the same as 1½ inch extra heavy black iron, but avoids the cost of flanges every 20 feet in the iron pipe.

The black plastic insert fittings used with polyethylene pipe on water service are not suitable for corrosive chemical service. Insert couplings and adaptors should be of 316 stainless steel with two or three stainless steel clamps and stainless steel bolts and nuts at each joint.

When the clamps are unable to pull the pipe down tight enough over the insert fitting, heat must be carefully applied to soften the plastic enough to make a leak-proof joint. Hot water is often not enough, so an acetylene torch in continuous motion at least a foot away from the pipe must be used to soften the plastic slightly. Heat may also be used to relieve strain on bends, but sharp bends or curves should be avoided. Chafing of the pipe is easily avoided by placing rubber around the pipe under the straps.

Plastic pipe is excellent for absorbing vibration from a mixer; at least three feet of plastic pipe should be used for this purpose and if operating personnel are near, only high-pressure polyethylene pipe shielded for safety should be permitted. The shield may be opaque or of safety glass, depending on whether a meter has to be read at the location. Naturally, any chemical lines should be located away from machinery and electric wiring.

Present installations of polyethylene pipe have been entirely satisfactory, particularly in regard to minimum maintenance and sediment-free operation after shut-downs. Meters and sight glasses stay clean longer, and there is no corrosion from dust settling on the outside.

Availability of polyethylene pipe is excellent. *Further details and recommendations may be obtained from Technical Service, Nitrogen Division, Allied Chemical Corporation.*

HOW THE MAGNETIC FLOW METER WORKS

The common image of the electric generator is of a thing of metal and insulation, complete with armatures, field coils, brushes and wires. Paradoxically, in the magnetic flow meter we have an electric generator in which the moving fluid is the armature, the electrodes are the brushes and the field coils are outside the section of pipe in which the liquid flows. Electrical signals are small, and, therefore, the unit needs shielded wire, correctly installed, to avoid interference. Shown below is a cross-section diagram of a typical magnetic flow meter.

Easy To Read

The voltage generated in the magnetic flow meter is directly proportional (linear) to the velocity of the liquid. The net result, obtained by multiplying velocity by pipe area is a true volume flow meter which measures gallons per minute (or some other volume unit, such as cubic feet per hour) of the fluid *at its flowing condition.* Where a reading in weight units is desired, simply multiply the volume figure by the actual density in pounds per gallon or pounds per cubic foot of the liquid as it passes through the flow meter.

Since the fluid passing through the meter serves as the unit's armature, it must be able to conduct electricity. This need be only as much conductivity as is found in ordinary city water. In fact, in special design units even less conductivity may be used.

There could be occasions where it would be necessary to add a very small amount of high conductivity fluid to the main stream in order to get satisfactory flow meter operation. However, where ARCADIAN Nitrogen Solutions are used this problem cannot arise because these materials are excellent conductors and meter calibration is not affected by any change in liquid conductivity.

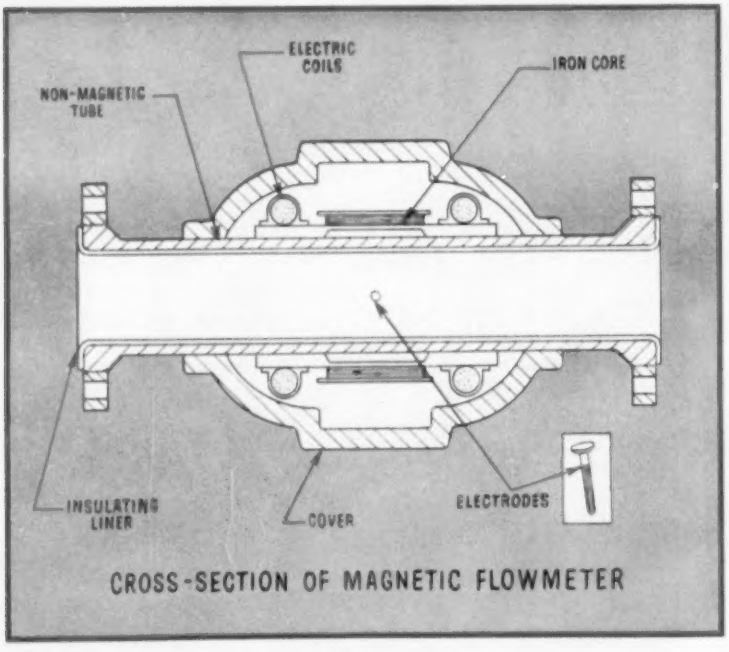
Meter Design Ideal for the Job

The magnetic flow meter is admirably fitted to its function. It has a smooth interior surface, lack of pressure loss and constant calibration. Changes in density of the liquid will not change the meter's volume reading. One hundred gallons of U-A-S® A produce the same reading as 100 gallons of NITRANA® 4, or any other ARCADIAN Nitrogen Solution.

The magnetic flow meter will measure flow in either direction, with the addition of a reversing switch. Units are available in almost any pipe size and can be hooked up to operate indicators, recorders, integrators and controllers located close by or at remote positions.

Outstanding Accuracy

The magnetic flow meter is remarkably accurate. Exhaustive tests measuring as much as 10,000 gallons at a time at Nitrogen Division's South Point plant have shown that this flow meter has an accuracy that is better than one per cent of the flow reading. Tests also show that this meter measures volume so accurately that small quantities of entrained gas are included in flow readings. *For more information on the operation and maintenance of magnetic flow meters, write Technical Service, Nitrogen Division, Allied Chemical Corporation.*



CROSS-SECTION OF MAGNETIC FLOWMETER

Arcadian® NITROGEN SOLUTIONS

	CHEMICAL COMPOSITION %						PHYSICAL PROPERTIES		
	Total Nitrogen	Anhydrous Ammonia	Ammonium Nitrate	Urea	Water	Neutralizing Ammonia Per Unit of Total N (lbs.)	Approx. Sp. Grav. at 60° F	Approx. Vap. Press. at 104° F per Sq. In. Gauge	Approx. Temp. at Which Salt Begins to Crystallize °F
NITRANA®									
2	41.0	22.2	65.0	—	12.8	10.8	1.137	10	21
2M	44.0	23.8	69.8	—	6.4	10.8	1.147	18	15
3	41.0	26.3	55.5	—	18.2	12.8	1.079	17	-25
3M	44.0	28.0	60.0	—	12.0	12.7	1.083	25	-36
3MC	47.0	29.7	64.5	—	5.8	12.6	1.089	34	-30
4	37.0	16.6	66.8	—	16.6	8.9	1.184	1	56
4M	41.0	19.0	72.5	—	8.5	9.2	1.194	7	61
6	49.0	34.0	60.0	—	6.0	13.9	1.050	48	-52
7	45.0	25.3	69.2	—	5.5	11.2	1.134	22	1
URANA®									
6C	43.0	20.0	68.0	6.0	6.0	9.3	1.180	12	39
6M	44.0	22.0	66.0	6.0	6.0	10.0	1.158	17	14
10	44.4	24.5	56.0	10.0	9.5	11.0	1.114	22	-15
11	41.0	19.0	58.0	11.0	12.0	9.2	1.162	10	7
12	44.4	26.0	50.0	12.0	12.0	11.7	1.087	25	- 7
13	49.0	33.0	45.1	13.0	8.9	13.5	1.033	51	-17
DURANA®									
DURANA is a trade-mark of Allied Chemical Corporation.	37.0	13.3	53.4	15.9	9.4	7.2	1.235	0	36
U-A-S®									
A	45.4	36.8	—	32.5	30.7	16.2	0.932	57	16
B	45.3	30.6	—	43.1	26.3	13.5	0.978	48	46
Anhydrous Ammonia	82.2	99.9	—	—	—	24.3	0.618	211	-108

*DURANA contains 8% formaldehyde.

Other ARCADIAN® Products: URAN® and FERAN® Solutions • Ammonia Liquor • N-dure® A-N-L® • Ammonium Nitrate • UREA 45 • Nitrate of Soda • Sulphate of Ammonia

When you purchase your nitrogen requirements from Nitrogen Division, Allied Chemical, you have many different nitrogen solutions from which to select those best suited to your ammoniation methods and equipment. You are served by America's leading producer of the most complete line of nitrogen products on the market. You get formulation assistance and technical help on manufacturing problems from the Nitrogen Division technical service staff. You benefit from millions of tons of nitrogen experience and the enterprising research that originated and developed nitrogen solutions.

NITROGEN DIVISION

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St. Paul 14, Minn., 764 Vandalia St. ..... Midway 5-9141
San Francisco 4, Cal., 235 Montgomery St. Yukon 2-6840

INDUSTRY PERSONNEL NEWS

Transferred to Atlanta

HOUSTON, TEXAS — Retzloff Chemical Co. has announced the transfer of Latane Lamb to Atlanta, Ga., where the company has installed new facilities for warehousing and laboratory evaluations for agricultural emulsifiers used in the pesticide industry. Mr. Lamb formerly operated out of Retzloff's Houston office. His move to Atlanta is being made in recognition of the increased importance of pesticide formulations in the southeastern portion of the U.S., served from the Atlanta office, the company says.

Latane Lamb

The announcement was made by A. F. Retzloff, president.

●

Officer Named

HUNTSVILLE, ALA.—William D. Tucker, who has been connected with the John Blue Co., Inc., of Huntsville, Ala., for more than 25 years, has been elected to the office of executive vice president of the firm, according to an announcement by John Blue, chairman of the board and president. The company manufactures applicators, valves, pumps and metering devices for fertilizers and pesticides. It will observe its 75th anniversary in 1961.

●

Becomes Board Chairman

STAMFORD, CONN.—William L. Oliver has been named chairman of the board of Dorr-Oliver, Inc., Stamford. He has been vice chairman of the board since 1956 and also served as general counsel for the corporation. Dorr-Oliver, Inc., is an engineering and manufacturing firm specializing in fluid and particle dynamics.

●

To Illinois Assignment

DANVILLE, ILL.—Bill B. Mainord has been appointed by Federal Chemical Co. as assistant sales manager of its Danville, Ill., sales division.

Mr. Mainord is a 1949 graduate of the University of Missouri where he majored in agronomy. He joined the Federal organization in April, 1959. Mr. and Mrs. Mainord and their two daughters live at Ridge Farm, Ill.

●

Best Names Manager

OAKLAND, CAL.—The Best Fertilizers Co. has announced the promotion of Jack O'Connor to manager, lawn and garden division. Mr. O'Connor, a graduate of the University of California, has been assistant division manager. This division of Best is headquartered in Oakland. Also announced was the addition to the lawn and garden division of Jim Bryson as technical service representative. Mr. Bryson comes from California State Polytechnic College.

Sales Representative

NEW YORK—The appointment of a fertilizer sales representative for Bradley & Baker has been announced by the company. The new appointee is H. Clair Dyer, who has been associated with the fertilizer industry in the middle west for many years. Mr. Dyer will be responsible to the firm's St. Louis office and will reside in Peoria, Ill. With Peoria as his home base, he will call on fertilizer manufacturers throughout the state of Illinois.

H. Clair Dyer

●

To New York for IMC

SKOKIE, ILL.—Tunstall I. Lemon has joined International Minerals & Chemical Corp. as manager-freight for the overseas operations division. He will be stationed in New York City, with responsibility for arranging shipping and chartering for overseas markets for IMC's agricultural and industrial chemical products.

Mr. Lemon was formerly manager of chartering in New York City for Lykes Brothers Steamship Co., Inc.

●

Stauffer Appointment

NEW YORK — Wyman L. Taylor has been appointed eastern sales manager industrial chemicals division, by Stauffer Chemical Co. The appointment was announced by Roger W. Gunder, vice president. Mr. Taylor was formerly administrative assistant to the vice president. He joined Stauffer in 1946.

●

Entomologist Chosen

STATE COLLEGE, MISS. — Dr. Theodore B. Davich, since 1956 in charge of basic cotton insect research laboratory, entomology research division, College Station, Texas, has been appointed to head the boll weevil research laboratory under construction here.

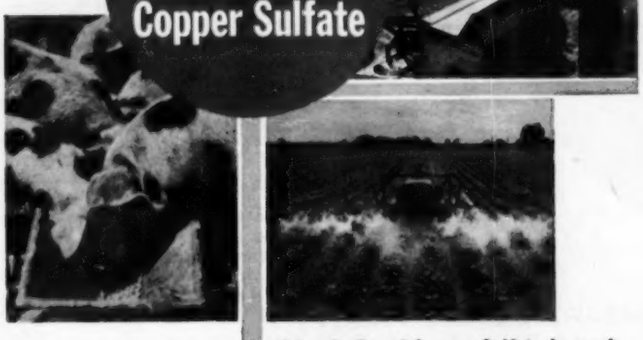
The $3 million Regional Boll Weevil Research Center, for which funds were appropriated earlier this year, is expected to be completed by July,

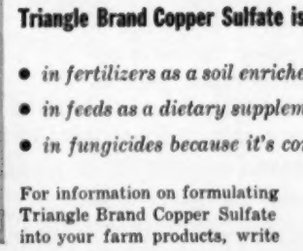
In many ways

a farm indispensable...

that's why sales-minded dealers formulate with...

Triangle Brand Copper Sulfate





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1961, and will serve as a research center for the entire cotton belt.

The announcement of Dr. Davich's appointment was made by Rep. Jamie L. Whitten, chairman Agriculture Appropriation sub-committee, Washington. Dr. Davich's appointment became effective as of Oct. 30.

●

To Sales Territory

SAVANNAH, GA. — The appointment of Roland R. Granger as sales representative for Southern Nitrogen Co. in Alabama has been announced by the company. In his new position Mr. Granger will handle the sale of all the company's products in the sales territory.

Roland R. Granger

He is a native of Cottonwood, Ala., and a graduate of Auburn University. He entered the U.S. Navy shortly after receiving his B.S. degree in agriculture in 1951. Following his discharge in 1955, he joined the Alabama extension service and served as assistant county agent, specializing in soil testing and the promotion of the Alabama extension service soil fertility program.

●

Niagara Appointments

FRESNO, CAL. — New appointments in Niagara Chemical's western agricultural department have been reported by Dr. G. F. McLeod, the department's manager of technical service to sales. Keith Rathbone and W. H. Wade were named to regional technical service managerial posts, while Donald H. Little and James Skelsey were made regional technical service representatives.

Mr. Rathbone will serve as the manager of technical service to sales for the San Joaquin Valley (Cal.) region, with headquarters in Fresno. He previously was a technical service to sales representative and before that was with the Butte County Agricultural Department. He is a graduate of California State Polytechnic College.

Mr. Wade has been assigned manager of technical service to sales for a region comprised of northern and west central California, Nevada, and Utah. For the past two years he has worked in Niagara's technical service to sales department. He is a graduate of the University of California.

Mr. Little will operate as a technical service to sales representative in the San Joaquin Valley. He joins Niagara after considerable pesticide sales experience with Pacific Guano Co. and Paramount Pest Control Service. Mr. Little holds a M.S. degree from the University of California.

Mr. Skelsey will represent Niagara technical service to sales in Washington, Oregon, Idaho, Montana, and Wyoming. From 1957-1959 he was a graduate research assistant at the University of California. He also earned his B.S. and M.S. degrees there.

●

Bemis Appointment

ST. LOUIS, MO.—Daniel R. Porter, Jr., has been named sales service manager for the St. Louis paper specialty plant, Bemis Bro. Bag Co., it was announced by A. L. Park, manager, paper specialty plants.

Mr. Porter, who joined the company in 1955, received sales training at the St. Louis plant and was assigned as a paper specialty salesman at the firm's Crossett, Arkansas, paper specialty plant.

Joins Star Enterprises

CASSOPOLIS, MICH. — Star Enterprises, Inc., Cassopolis, manufacturer of "Creek-O-Nite," announces the appointment of Tom Prather as head of purchasing, warehousing, and traffic.

Tom Prather

He was formerly manager of the wholesale division of the Ridge Automotive Supply Co. in South Bend, Ind., where he was employed from 1954 until accepting his new position with Star Enterprises.

Mr. Prather attended Michigan State University, receiving his diploma in 1952. He will be located at the home office in Cassopolis.

●

To Research Posts

NIAGARA FALLS, N.Y.—Dr. J. Howard Brown, Robert F. Schultz, and Dr. Alvin F. Shepard have been named to new posts in a realignment of the corporate research and development department of Hooker Chemical Corp., it was announced by Dr. Chris A. Stiegman, newly elected vice president—research and development.

Dr. Brown has been appointed manager—research; Mr. Schultz, manager—process development; Dr. Shepard, senior scientist—all reporting to Dr. Stiegman.

●

Chemagro Shifts Regional Personnel

KANSAS CITY, MO.—Introduction and marketing of new agricultural chemical products have necessitated changes in the sales department of Chemagro Corp., Kansas City, according to Hugh H. Swink, vice president of sales.

Chemagro has recently formed its Southern Region, which comprises states in the southeastern and south central parts of the country—an area that was formerly part of other Chemagro sales regions.

Stanford L. Adams has been appointed sales manager of this new region, with headquarters in Memphis, Tenn. He was formerly a sales representative in the Eastern region.

In connection with its sales expansion program, Chemagro has shifted personnel in some key positions, and added sales and technical personnel in all regions.

W. Scott James, formerly sales manager of the Eastern region and advertising manager, has been transferred to company headquarters at Kansas City and named director of advertising, a new position. He will be responsible for all advertising, public relations, and sales promotion activities.

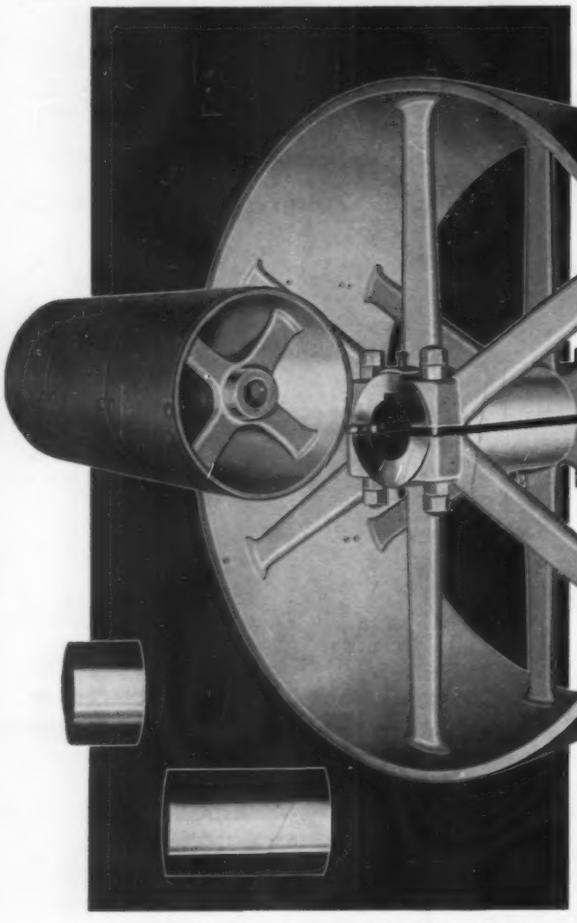
William H. Bricker, formerly a sales and technical representative in the Central region, succeeds Mr. James as manager of the Eastern region. The new headquarters for this region is located at Haddonfield, N.J. It was formerly in Richmond, Va.

Other regional sales offices are located in St. Louis and San Mateo, Cal.

Allied closely with the sales expansion plans are increased activities in the area of market development. To assist in directing these activities, Kenneth R. Holden has been appointed assistant director of market development, a new position. He was formerly a sales representative in the Eastern region.

Recent additions to the Chemagro sales organization include: A. Edward Huckabee, F. Dale Hanna, Russell W. McCalley, and J. Robert McCambridge, Western region; Paul W. Steinbrecher, Central region; Samuel F. Stewart and Frederick H. Schmidt, Eastern region; James E. Bailey, Southern region.

PULLEYS



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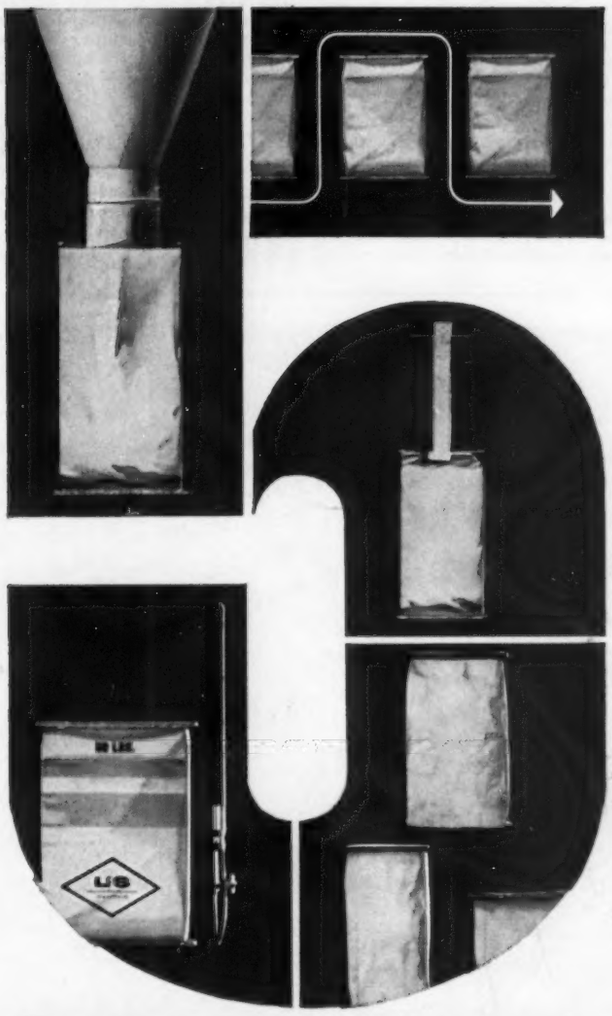

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Fourth is *specifications control*. This covers standardization of multiwall bag styles, elimination of unnecessary odd sizes and the freeing of valuable warehouse space.

And finally, *packaging machinery*. By following recommendations made by UNION-CAMP engineers, dozens of companies have speeded their bagging and handling rates...saved thousands of dollars in lowered labor costs.

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TECHNOLOGY

(Continued from page 16)

tion of agriculture and the chemical industry will expand.

Granulation of mixed fertilizers has been a major development in technology during the past decade. Initiated as a way of improving physical condition, it is making a major contribution to better fertilizers nutritionally, to reduced farm labor, and to economies in formulation. Granulation has been a natural development following that of high ammoniation of superphosphates.

To achieve granulation, formulation is adjusted to include ingredients having a steep solubility curve making possible a high "liquid phase," which is the total amount of water and salt solution. With these salts in the formula, the addition of moderate amounts of moisture and temperature increase substantially the "liquid phase." The heat of reaction of ammonia with superphosphate is supplemented by the reaction of additional ammonia with an acid, either sulfuric or phosphoric acid. Moisture is increased as necessary to provide a wet mix of suitable consistency to be rolled or agglomerated into granules. Drying, cooling and screening follow.

Granulation involves a higher processing cost but avoids the necessity of "bin curing." Off-season deliveries can be made because of good storageability permitting more uniform rates of plant operation and larger annual output. The farmer user can apply fertilizer with less labor and delays at the peak work period. More uniform rate of application is assured causing higher yields. The reduced surface contact with the soil increases phosphorus efficiency.

A steady increase in concentration of mixed fertilizers has accompanied the introduction of new materials and granulation. This increase causes savings in cost per unit of plant nutrient in plant processing, packaging, delivery, and handling on the farm. An example is the application of representative costs to three grades of 1-1-1 ratio. With a given set of conditions, a 7-7-7 would deliver at $2.45 per unit of plant food, a 10-10-10 at $2.11, and a 13-13-13 at $1.92. The savings in cost as a result of the trend to high-analysis fertilizers are substantial and are becoming more important as the usage per farm increases.

The increased use of phosphoric acids and ammonium phosphates in the mixed fertilizer industry is raising the proportion of phosphorus in the water soluble form. This is probably regarded as a favorable trend following a period of gradual depression of the water soluble phosphorus level as rates of ammoniation of superphosphate have increased. With the use of phosphoric acid or ammonium phosphates in granulated mixed fertilizers, it is entirely possible to produce mixtures having 60% or more water soluble phosphorus and still ammoniate at fairly high rates.

Trace Elements

There is a trend toward inclusion of the secondary and minor nutrients generally found deficient in a given area. This is consistent with the need for higher yields per acre and more labor-saving features in farm production supplies. Higher yields make more demands upon these secondary and minor nutrients in the soil solution. The labor-saving features are becoming increasingly important.

In a similar category are the fertilizer pesticide mixtures toward which the fertilizer industry, and many control officials, have taken a dim view. The use of such mixtures appears to be on the increase in spite of attitude, the reason again being the labor-saving feature. It may be that in some cases a separate application of the agricultural chemical would cause more effective control, but the combination treatment does an acceptable job. The first cost may be a little higher but labor is saved, usually at a critical period.

I believe that, if we reflect back on our current trends in agriculture, the reasoning of the farmer is understandable. He is having to increase his acreage farmed, utilize more aids to crop production, keep more cattle —and stretch his working capital.

Let us say that he is operating a two-man farm and satisfactory casual labor is difficult to secure. To abruptly change to three men would seriously reduce his labor income for a period. His choice of the alternative of utilizing more services and more labor-saving features therefore becomes understandable.

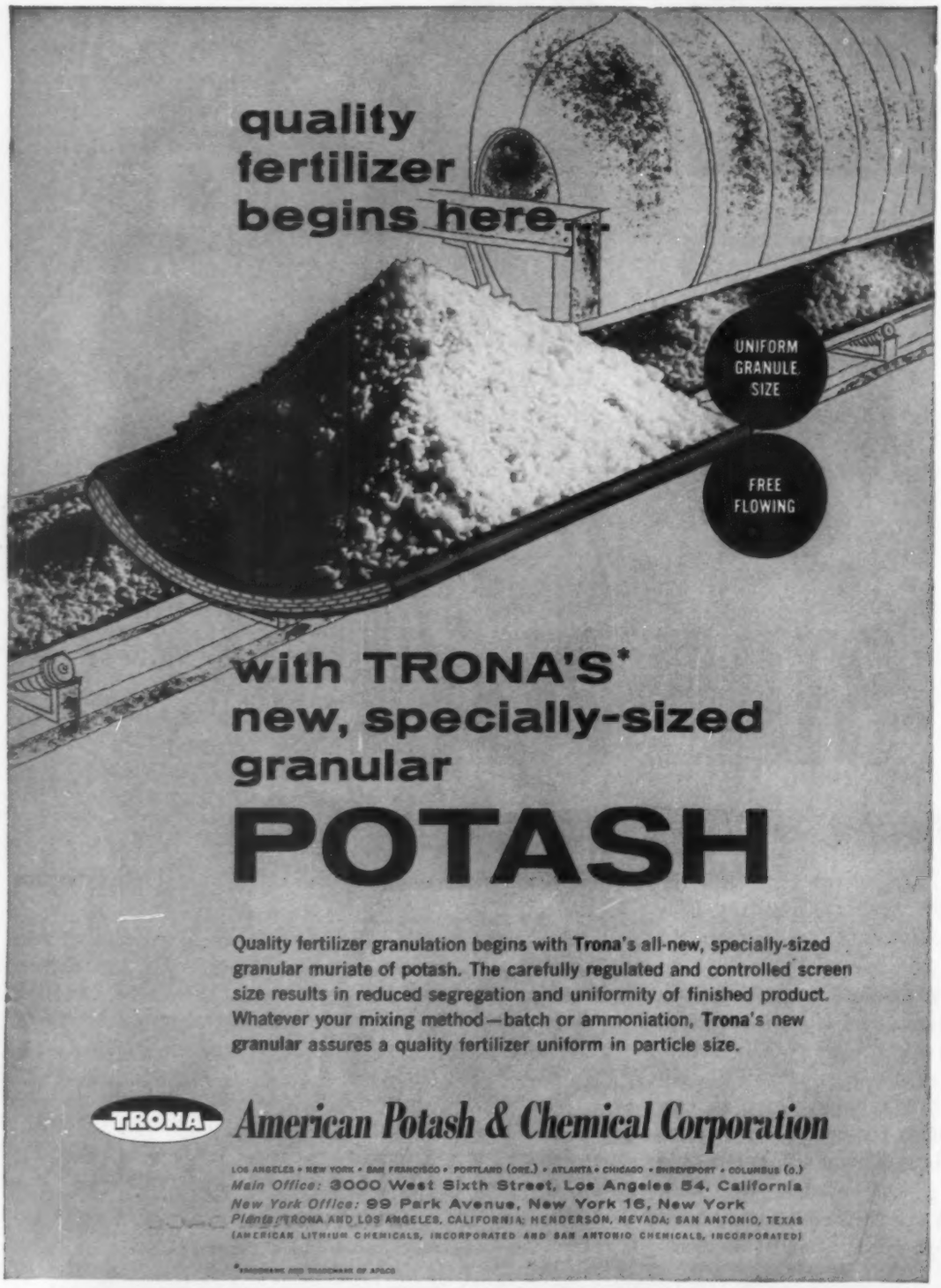
Along similar lines is an important technological development in the mixed fertilizer industry. I refer to the offering of inverse ratios or, as sometimes called, exotic ratios. These include 1-0-1, 2-1-2, 3-2-2, and 2-1-1. Here again, labor is saved on the farm by avoiding a second application. The production of grades in these ratios is aided by the above-mentioned developments of high ammoniation and use of phosphoric acid. It is further aided by preneutralization. This enables reaction of additional ammonia with sulfuric or phosphoric acid in a vessel associated with a continuous ammoniator mixer. Sufficient ammonia as anhydrous or contained in a nitrogen solution is fed directly to the ammoniator to react with any superphosphate used.

Sufficient additional anhydrous or nitrogen solution to furnish the balance of nitrogen in the grade is fed to a vessel located near the mixer. Sufficient acid to just neutralize the ammonia is also fed continuously to the vessel. A third ingredient, water, is metered into the vessel in quantity to lower the solution temperature to about 280° F. by evaporation cooling. This temperature is well below the decomposition temperature of ammonium nitrate. The slurry resulting from the neutralization continuously flows by gravity to the ammoniator mixer where it mixes with the solid ingredients in the grade formula.

It is appropriate, I believe, to comment at this point on so-called "complex fertilizers."

One primary difference between three-nutrient fertilizers and mixed fertilizers as generally produced in the U.S. is that nitric acid is reacted with rock phosphate along with sulfuric or phosphoric acid and the resulting slurry is mixed with muriate of potash. There are several such processes varying in the chemical reactions, the equipment used, the wa-

(Turn to TECHNOLOGY, Page 26)



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Fertilizer Production Problems Covered in Processing Clinics

SKOKIE, ILL.—A series of eleven fertilizer manufacturing clinics sponsored by International Minerals & Chemical Corp. is nearing its conclusion after a number of successful meetings in the midwest and south.

The symposia are held in central locations with fertilizer manufacturers of the area being invited to attend and to take part in the discussions led by IMC personnel.

Based on surveys made earlier in the year, the meetings place a high priority on practical operational problems in the fertilizer plant, stressing ways to evaluate and halt inventory shrinkage in the plant; scrubbing and dust control; handling of liquids; quality control; laboratory costs; plant maintenance problems; supervision; and communication problems within the plant.

Sources of loss of plant food in the plant are listed as arising from handling of materials by front end loaders, conveyors and liquid handling equipment, and by weighing and metering devices.

Materials lost in process are usually due to inefficient equipment, uncontrolled chemical reactions, dust and fumes, and in packaging operations, the speakers say. The clinics elaborate on each subject and discussions from the floor are invited.

Various types of dust collectors and scrubbers are explained and discussed at the clinics, with schematic drawings and photographs being projected on a screen while the discussion leader describes the equipment.

Different types of meters for measuring liquids are similarly described and flow diagrams shown on a screen. Sparger pipe hole sizes are also discussed, with charts showing how to calculate the number of holes required to handle a given amount of acid under given pressure, volume and velocity. The clinic advises manufacturers to "always make certain you are using approved installations; know the physical and chemical properties of the liquids used; always have available the proper safety equipment, and use only competent and trained operators."

The clinics presented sample inventory sheets, formulation sheets, batch operation control data sheets, continuous control data sheets, shipping sheets, and repair order forms as examples of the type of record-keeping necessary to smooth operations in the plant.

Richard G. Powell, manager of technical service for IMC, estimates that more than 400 plant owners, superintendents and other supervisory personnel will have attended the clinics by the time the series ends on December 15.

The sessions began Oct. 24 in Minneapolis, Minn. with subsequent meetings at Indianapolis, Ind.; Baltimore, Md.; New York; Raleigh, N.C.; and Toledo, Ohio. Yet to be held are clinics at Winter Park, Fla., Nov. 28-29; Montgomery, Ala., Nov. 30-Dec. 1; Kansas City, Dec. 5-6; Tyler, Texas, Dec. 12-13; and Jackson, Miss., Dec. 14-15.

Davison Promotion

BALTIMORE, MD.—John T. Sadler, Jr., has been promoted to director of purchases of the mixed fertilizer division, W. N. Watmough, Jr., vice president of the Davison Chemical Division of W. R. Grace & Co. has announced.

Mr. Sadler has been assistant director of purchases for the past three years and moved into the present position with the retirement of Edward A. McGinity.

TECHNOLOGY

(Continued from page 24)

ter solubility of phosphorus in the product, and amount of secondary or minor nutrients.

There are several such processes used in Europe. In this country, the chemical and development branch of TVA has also developed such processes. Only a few such plants have been built in the U.S., the most recent under construction is one in Iowa.

There are two other developments in the industry which have become quite general and, in a way, are the opposite of complex fertilizers. These are liquid fertilizers and bulk blending. It appears that initial interest by the farmer has been attracted by the custom spread service offered by liquid fertilizer manufacturers in order to encourage initial use of their product on the farm.

Note that I refer to both of them as mixtures. Where the type of agriculture, its concentration, and other economic considerations are favorable, initial orders for spread service are in many cases being followed by the purchase of suitable storage and application equipment on the farm. An advantage of this type of operation is a relatively low investment per plant permitting a local businessman to open shop. With low production per location, the average outgoing freight is also relatively low. The delivered cost of fertilizer may or may not be cheaper because of offsetting somewhat higher cost of ingredients and low tonnage in relation to investment and operating costs. Liquid fertilizers, both nitrogen materials and three component liquids, and bulk blending will continue to grow for the abovementioned reasons. Findings at the chemical and development branch, TVA, of means to increase concentration of liquid mixed fertilizer permits them to be transported in a wider radius from a plant. There is still a limitation on the inclusion of secondary nutrients.

The trends in agriculture are quite clearly evident. Political maneuvers have some effect on their rate and sometimes cause some detours, but do not affect the ultimate. It is evident also, I suggest, that the technology of fertilizer production is making rapid advances with the result that fertilizers are improving in chemical and physical properties and, yet, remaining relatively the lowest cost farm production supply.

Fertilizers can be produced economically which meet changing agronomic needs, ratios, amounts of secondary and minor nutrients and forms of nutrients. Fertilizer technology is meeting the challenge of a changing agriculture.

FIRE PREVENTION TIPS

E. A. Wecker, superintendent, fire department, Dow Chemical Co., Midland, Mich., offers the following as rules for plant fire safety:

- **Practice good housekeeping to assist in fire prevention.**
- **Keep fire equipment accessible at all times.**
- **Report used or defective fire equipment to the fire department immediately.**
- **Do not block fire doors.**
- **Avoid the use of flame or spark-producing devices in hazardous areas if other means are available.**
- **Know first aid fire extinguishing equipment and, if necessary, enlist the aid of a trained individual to learn how.**
- **Call the fire department in case of fire or potential fire hazardous conditions.**
- **Obey properly established smoking rules.**

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The Simonsen spreader is not an adaptation of a lime spreader. It is designed to spread high analysis fertilizers accurately and evenly, down to 75 lbs. per acre. Superb performance results in positive customer satisfaction, and unequalled maintenance-free operation. Leasing plans available.

GET THE TROUBLE-FREE FEATURES YOU WANT

- Non-Corroding stainless steel at all critical points—apron, metering gate and guides, take-up bolts, drive chains.
- All-weather wheel drive assembly.
- Hydraulic fan drive.
- Outside compartment door hinges.
- Simple adjustment for spreading rate.
- Rubber shock absorbers on hoods.

WRITE, WIRE OR PHONE COLLECT for further information about the R710, plus a full line of other Simonsen bulk fertilizer bodies and the new Simonsen Feedilizer (a dual-purpose bulk feed and bulk fertilizer body).

SIMONSEN ALSO MAKES A FULL LINE OF BULK FEED BODIES, COMBINATION BULK FEED AND SACK BODIES, AND UNLOADERS TO FIT YOUR PRESENT TRUCK BODY.

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adding boron boosts profits!

Borating your alfalfa fertilizer can mean bigger profits to you and your customers. Boron, a minor element, does major things for alfalfa. In fact, alfalfa responds so readily to boron that in some cases the yield actually doubles. Ample supplies of boron are so essential to profitable growth of alfalfa that most large producing states recommend *annual* applications. Each ton of alfalfa hay removed from the soil takes with it approximately 1.8 lbs. of borax – additional quantities are lost by leaching.

Building bigger profits for your customers by supplying this vital element in your alfalfa mixes can also build bigger profits for you. Millions of acres of alfalfa need boron *every* year. So, take advantage of this major market for a minor element. Always consult your state agricultural authorities for specific amounts to use.

Add boron! Add profit!

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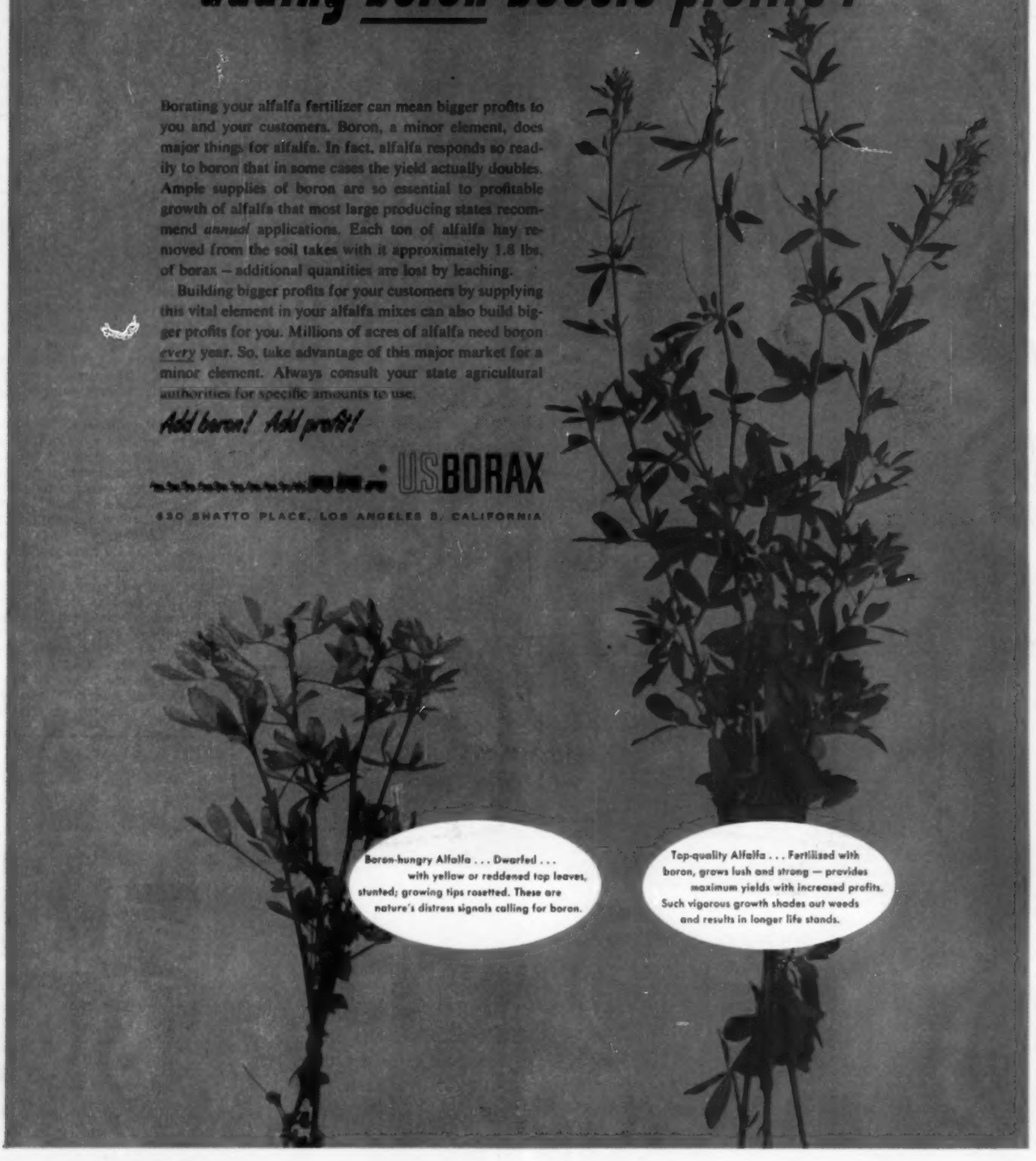
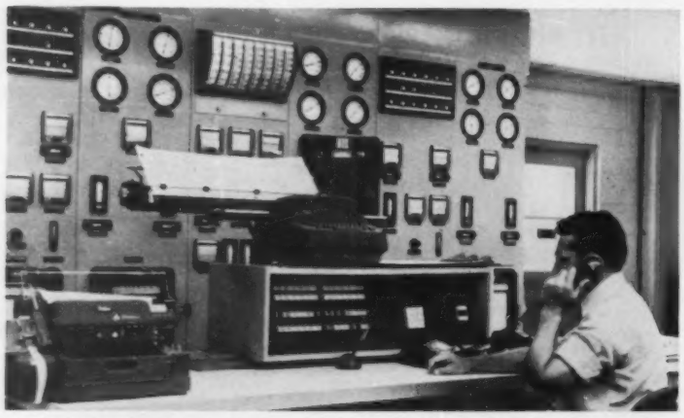


Boron-hungry Alfalfa . . . Dwarfed . . . with yellow or reddened top leaves, stunted; growing tips rosetted. These are nature's distress signals calling for boron.

Top-quality Alfalfa . . . Fertilized with boron, grows lush and strong — provides maximum yields with increased profits. Such vigorous growth shades out weeds and results in longer life stands.



AN OPERATOR sits at computer control console in the master control room at Monsanto's Barton plant in Luling, La. Processing data on the ammonia manufacturing operation issues from automatic typewriters linked to the complex electronic equipment. Thus, the two typewriters shown automatically provide a record of the plant operation, day by day.

Monsanto Ammonia Plant in Louisiana Uses Closed Loop Computer Control

LULING, LA.—An ammonia plant, which the company says has the first integrated chemical process to be commercially operated under closed loop computer control, has been announced by Monsanto Chemical Co. at its Barton plant in Luling.

According to H. Lonnie Payton, plant manager, some 400 persons are employed, working 24 hours a day and 365 days a year. The plant will primarily make ammonia for use in making nitric acid, ammonium nitrate fertilizer and a line of nitrogen fertilizer solutions.

The plant is one of two nitrogen plants comprising Monsanto's agricultural chemicals division. The other is located at El Dorado, Ark.

The computer instrument installed is the Ramo-Wooldridge 300. Two electric typewriters are linked to the unit and keep automatic records of the entire operation. One typewriter prints whatever the computer tells the various controls out on the line to do and it also records any orders the operators feed into the system themselves.

The other typewriter keeps the log. This logging machine, which has a carriage almost a yard wide, keeps up-to-the-minute facts recorded about conditions all along the 300 yard long process lines.

The computer receives the stream of facts, digests them and decides what should be done, if anything, to expedite production of anhydrous ammonia.

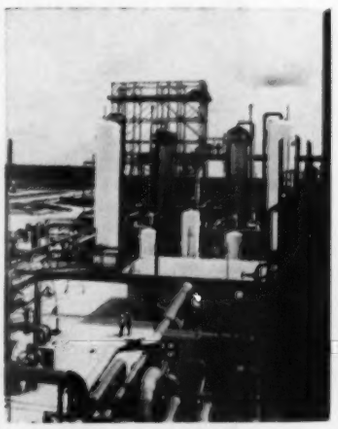
According to Monsanto, the computer, in effect, has been told beforehand what combinations of fuel, raw materials, temperatures, pressures and other variables will produce the greatest amounts of quality ammonia under a series of varied conditions. For example, as the sun swings overhead, conditions inside the equipment are affected by weather changes. The computer has been "trained" to compensate for such changes as they occur. Or if too much hydrogen or nitrogen shows up near the end of the stream, the computer automatically trims input back at the beginning so as to prevent waste of the purified gas.

A "fail-safe" feature of the computer automatically signifies something is wrong should a discrepancy occur in any of the processes.

The company says that results have exceeded expectations in the few months the computer has been in operation. The computer-controlled plant has been running at full capacity.

Mr. Payton says, "The plant manager can no longer run his operation from his hip pocket. A highly-trained team of engineers, technicians, programmers, operators and maintenance men must be organized to exploit the capabilities of a machine that reads data, calculates, sends out control signals and prints results all in a few seconds.

"The computer project objectives of increased production and higher efficiency have been successfully accomplished, we feel. The advantages of split-second calculation and control adjustment, complete and detailed observation of all process variables and extensive logging of data far outweigh the disadvantages."



MONSANTO Chemical Co.'s Barton Plant, Luling, La., is thought to be the first chemical plant in the nation to use direct, on-line computer control of an over-all chemical process. The building in the center of the plant houses the master control room from which the entire 300-yd. long process for making ammonia is regulated by computer.

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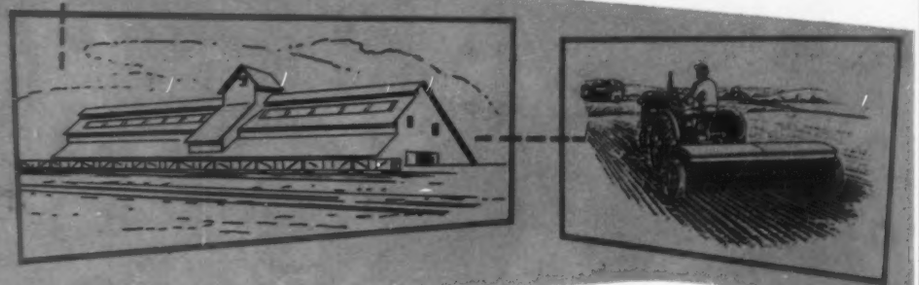

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Division
TENNESSEE CORPORATION

TABLE 1.—Shipments of Fertilizer Mixtures in Bulk for Retail Markets in Regions Years Ended June 30, 1954 and 1959

Region	Shipments[1]						Percentage of mixture shipments in region shipped in bulk			
	Mixtures[2]		Bulk							
			Solid		Liquid		Solid		Liquid	
	1954	1959	1954	1959	1954	1959	1954	1959	1954	1959
	Tons	Tons	Tons	Tons	Tons	Tons	Percent	Percent	Percent	Percent
New England	351,913	373,619	1,923	917	91	141	0.55	0.24	0.02	0.04
Middle Atlantic	1,837,913	1,815,887	71,240	117,660	229	14,544	3.88	6.48	.01	.80
South Atlantic	5,022,006	5,160,196	168,148	392,022	161	14,535	3.35	7.60	3/	.28
East North Central	3,621,134	3,632,495	111,201	335,713	1,879	157,478	3.07	9.24	.05	4.34
West North Central	1,343,116	1,552,608	77,124	298,982	412	119,551	5.74	19.26	.03	7.70
East South Central	2,039,846	2,078,604	33,806	63,660	117	11,947	1.66	3.06	.01	.57
West South Central	713,060	691,316	3,608	13,656	1,385	18,880	.50	1.98	.19	2.73
Mountain	56,192	73,524	303	6,503	1,035	16,188	.54	8.84	1.84	22.02
Pacific	272,873	412,144	2,070	37,856	22,239	102,964	.76	9.18	8.15	24.98
Hawaii and Puerto Rico	283,023	278,634	0	418	0	7,735	0	.15	0	2.78
United States	15,541,076	16,069,027	469,423	1,267,387	27,548	463,963	3.02	7.89	.18	2.89

1/ Includes all quantities of the grade 8-24-0 but excludes 11-48-0, 13-39-0, 16-20-0, 27-14-0, and 21-53-0. 2/ Total of packaged and non-packaged commercial mixtures. 3/ Less than 0.005 percent.

Shipments of Bulk Fertilizer Increase in 1954-59 Period

WASHINGTON—Tonnages of bulk shipments of fertilizer more than doubled during the period 1954-59, according to figures compiled by Walter Scholl, Marion M. Davis, and Caroline A. Wilker, Agricultural Research Service, USDA, Beltsville, Md. and reported at the recent Fertilizer Control Officials' meeting.

The report said that liquid fertilizers increased nearly four times, and solids increased about half again above the 1954 figure. The statisticians explained that liquids had a much smaller base period, being relatively new, and that the growth pattern was of course more rapid. Of all bulk fertilizers retailed in 1954, liquids represented but 2.58%, while solids comprised 8.03%.

Quantities of solid bulk shipments in 1959, compared with 1954, were higher in 33 and lower in 17 of the states. In 1959, solids shipped in bulk ranged from 0.02% in Maine to 36.64% in Illinois of all fertilizer shipments in the respective states. Tonnages of liquids, however, were substantially higher in all states excepting West Virginia and the District of Columbia. Shipments of liquids ranged from 0.01% in West Virginia to 52.43% in Nebraska of all fertilizer shipments in these states in 1959.

Bulk shipments (solids and liquids) were substantially highest in California, Illinois, Iowa, and Missouri. Their combined tonnages represented 48% of the national total of bulk shipments in 1959.

Mixtures shipped in bulk in 1959 accounted for 46% of the national total of solid bulk shipments and 21% of liquid shipments. In 1954, these proportions were 26 and 5%, respectively. In 1959, solid mixtures shipped in bulk ranged from 0.15% in Hawaii and Puerto Rico to 19.26% in West North Central of all shipments of mixtures in the regions. Solid mixtures shipped in bulk in 1959 amounted to 7.89% in comparison with 3.02% for 1954 of the national consumption of mixtures.

In 1959, shipments of liquid mixtures ranged from 0.04% in New England to 24.98% in the Pacific. The national use of liquid mixtures increased from 0.18% (1954) to 2.89% (1959) of all mixtures consumed. In the period 1954 to 1959 bulk shipments of mixtures increased in all regions excepting New England.

Of the materials, nitrogen shipped in bulk in 1959 accounted for 8% of the national total of solid bulk shipments and 77% of the liquid shipments. In 1954, these proportions were 2 and 92%, respectively.

In 1959, solid chemical nitrogen materials shipped in bulk ranged from none in Hawaii and Puerto Rico, to 21.93% in the Middle Atlantic region, of all shipments of these materials in the regions.

Solid nitrogen materials shipped in bulk in 1959 amounted to 4.71%, compared with 1.09% in 1954, of the national consumption in this class.

National use of ammonia, anhydrous, aqua and nitrogen solutions, increased from 16.62% in 1954 to 37.12% in 1959, of the total tonnage of chemical nitrogen materials consumed. Bulk shipments of these liquid products were substantially higher in all regions.

Phosphate materials shipped in bulk in 1959 accounted for 31% of the national total of solid bulk shipments and one percent of liquid shipments. In 1954, these proportions were 50 and 3%, respectively. Solid phosphate materials shipped in bulk in 1959 amounted to 33.90%, compared with 36.24% in 1954, of consumption of phosphate materials.

Potash materials shipped in bulk accounted for 5% (1959) and 1.5% (1954) of national total of solid bulk shipments. Potash solutions shipments were insignificant. Solid potash materials (1959) shipped in bulk ranged from 1.89% in South Atlantic to 47.05% in East North Central of all shipments of potash materials in the regions. Solid potash materials shipped in bulk in 1959 amounted to 26.62%, compared with 7.20% in 1954, of consumption of potash materials.

Other classes of materials shipped in bulk were the natural organics and the secondary and trace nutrient materials. In 1954 and 1959, the national consumption of the natural organics amounted to 420,088 tons and 517,948 tons. Of these amounts, 25,192 tons (6.00%) and 9,071 tons (1.75%) were shipped in bulk.

The authors say that this study indicates the quantity of fertilizer marketed to the retail trade in non-packaged form increased from 2,417,725 tons in 1954 to 4,910,955 tons in 1959. In 1954, non-packaged shipments were made up of solids (76%) and liquids (24%). In 1959, these proportions were for solids 56% and liquids 44%.

The growth in non-packaged shipments has been principally in liquids. On the other hand, packaged solids amounted to 20,355,774 tons in 1954 and 20,401,717 tons in 1959. Although the quantity of solid packaged fertilizers has changed little, the rate of growth has been much less than that of total fertilizer use.

Two Appointments By Midwest Bag Co.

DES MOINES—A promotion and an appointment at Midwest Bag Co. here were announced this week by Harry Pomerantz, president.

Dan Masters was named sales manager of Midwest and its Rocky Mountain Bag Co. division, Denver.

Pat O'Brien has joined the firm as plant coordinator.

Mr. Masters, with Midwest for 20 years, will be in charge of all sales territories and will supervise sales for all national accounts.

In his new post, Mr. O'Brien will be in charge of all production and traffic operators. He has a background of some 20 years experience in the materials handling field. Prior to joining Midwest, he was vice president in charge of terminal operations for General Expressways, Chicago.

NPFI Offers Books At Reduced Prices

WASHINGTON — The National Plant Food Institute announced that "In an effort to reduce our stock of books" they are offering "Hunger Signs in Crops" and "The Care and Feeding of Garden Plants," at $1.50 and $1, respectively, postpaid to domestic addresses.

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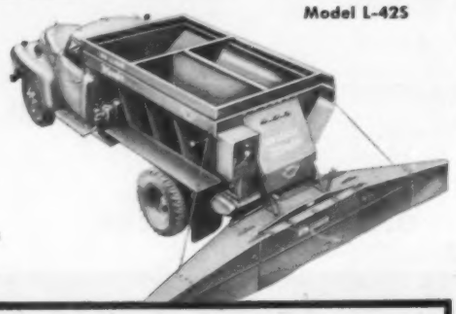

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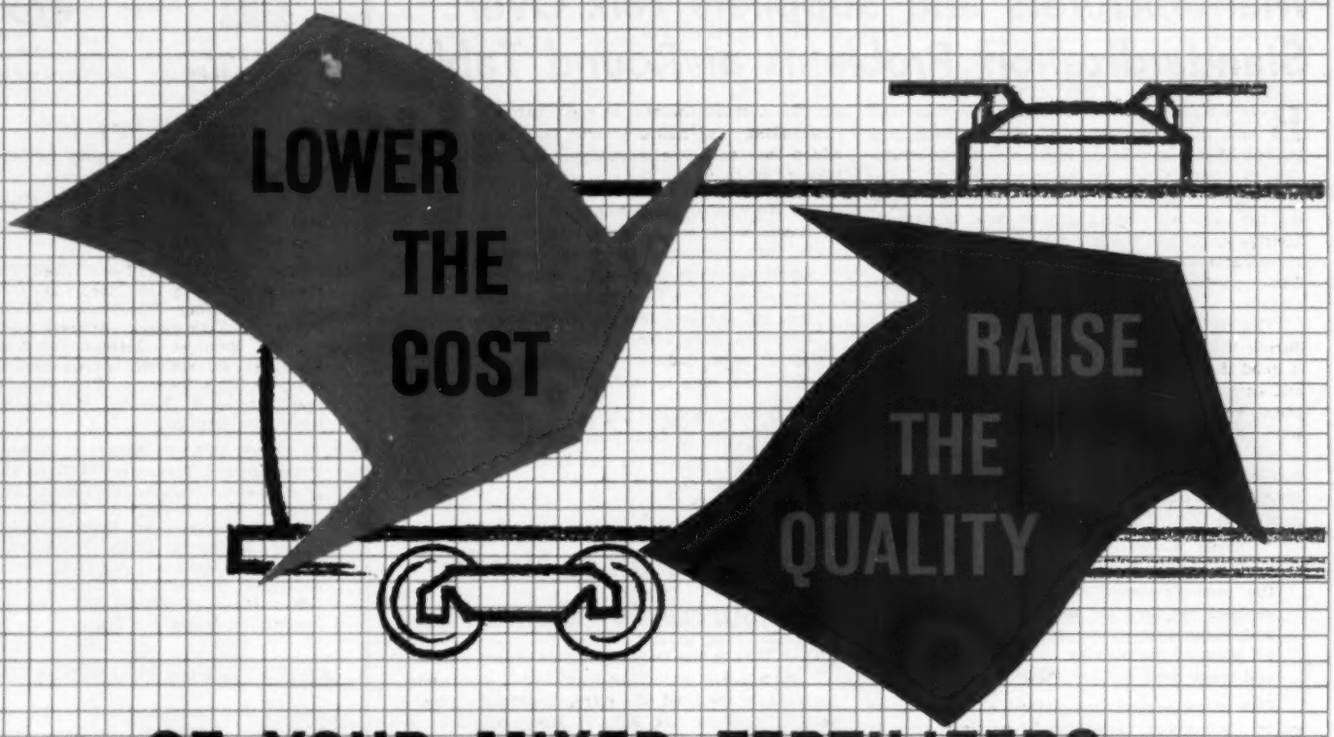

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In addition to these 7 advantages, you may find still other ways in which these unique DRI-SOL solutions can be useful to you. For example, these solutions can be used to help offset the high water content of low strength acid, or to produce those grades which are difficult or impossible to make with conventional solutions.

CSC's DRI-SOL Nitrogen Solutions are available in grades ranging from 24% ammonia and 76% ammonium nitrate to equal parts by weight of ammonia and ammonium nitrate. This new line of solutions is essentially anhydrous. Water content: about 0.5%.

DRI-SOL solutions are generally available in the Southern and Midwestern States. Technical literature available to fertilizer manufacturers.

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Manufacturers and Suppliers Talk Over Standardization Problems at Round Table

BOTH SUPPLIERS of fertilizer raw materials and the manufacturers who purchase and process these ingredients had unusual opportunities to communicate at the recent Round Table meeting in Washington. With panels of users telling the suppliers what might be done to improve their products and the latter having the floor later for rebuttal or explanations, the 450 fertilizer industry people in attendance got an earful of information.

That neither tomatoes nor epithets were hurled during the sessions indicates that the industry is in good shape so far as relations between suppliers and users are concerned. This does not mean that there were no areas where slight disagreements were evident, but we know of some industries where to pit suppliers against manufacturers on a public platform would be an open invitation to mayhem. Not so much as a hint of this was evident at the Round Table . . . a happy observation.

Areas where improvements could be made lay mostly in the need for uniformity, the manufacturers declared. They also stressed the need for universal terminology and phraseology which means the same in all parts of the country . . . such as screen and mesh sizes and analytical techniques.

One manufacturer complained about what he called "too great variations in particle sizes in potash," remarking that two successive cars his company had received from the same supplier had been extremely different. "One looked like a load of gravel and the other was very dusty," he reported.

Phosphate producers also came in for some minor criticism concerning analyses of raw material.

The suppliers, however, conducted their portion of the panel with competent portrayals of their own problems, and did a good job of convincing all present that great effort is being made continually, not only to find out what the specific needs of the industry are, but also to meet such demands with the best product possible.

They pointed out that technical men call regularly on manufacturers and that their reports form a basis for improvements in both product and service.

Potash suppliers pointed out that their product may vary slightly from one portion of a mine to another, and from day to day. However, analysis is made of every car shipped out and this information is available to the purchaser.

Superphosphate producers reported that specifications vary widely with different firms, as indicated by a data sheet compiled from information furnished by various supplying firms. These variations, it was reported, include figures on analysis, moisture, free acid, trade elements and particle sizes. Apparently there was universal agreement that something ought to be done about it, although it was evident that suppliers themselves are continually making efforts to improve the situation.

A summation of the panel was outlined by stating that suppliers and users of fertilizer raw materials need to redefine some of the rules of the road; to arrive at standards and specifications knowledgeable to all, and to break down the "language barrier" which fosters confusion . . . such as mesh sizes.

Each geographical region tends to have its own terminology and this, too, should be unified so that common names or specifications may be established, one manufacturer pointed out. He added that analytical techniques also need to be brought up to date.

We regard the recent discussions at the Round Table as a definite mark of progress in the fertilizer industry's transition into adulthood. True, not every last problem was settled nor even touched upon at the meeting, but the fact that suppliers and manufacturers were able to express themselves openly at an industry-wide symposium is a significant step in the right direction.

An understanding of the problems of both suppliers and users by both parties is the foundation of gaining the uniformity and specification standards which the speakers declared are needed so badly in the trade.

More Than Ideas Needed For Successful Operation

SUCCESS in the fertilizer manufacturing industry requires more than a good idea, it was emphasized by the head of a nitrogen producing company in a recent talk. John R. Riley, president of Southern Nitrogen Co., Savannah, Ga., pointed out that the chemical industry is both highly technical and highly competitive. Therefore, more than ordinary skills and business acumen are needed to keep such an enterprise going.

Here are some points worth thinking about made by Mr. Riley: First, one must have complete knowledge of and proven success in the field; second, he must have sponsorship of a reputable investment banking firm; third, a complete and independently-documented presentation and willingness to make a substantial investment.

Obviously, the fertilizer manufacturing industry is not one to enter with less than complete preparation on all these points.

Training and maintaining good operating personnel is also a major factor in the successful operation of manufacturing facilities. The secret is to get experienced men in the first place and then to do everything reasonably possible to keep them. The industry's record is relatively good in this regard. For instance, Mr. Riley reports that of the 35 original management and supervisory personnel employed five years ago, 33 are still with the firm. Seems to us that this is a pretty good record.

Teams of talented production men and technical management personnel are one of the most valued assets of the industry. It pays to keep training methods up to date as technology in the trade advances.

Big Production Foreseen

INTRODUCTION of needed fertilization programs in some areas of the world could easily double or even triple fertilizer production, according to a recent statement by Dr. Frank W. Parker, an administrator of the crop improvement phase of the U.N. Freedom from Hunger campaign. "The current annual world consumption of fertilizer will be taken up by Asia alone by the year 2000," he said, and predicted that "total consumption must rise to more than 100 million tons a year if food supplies are to be adequate."

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INDUSTRY MEETINGS

Nov. 28-29—Twelfth annual fertilizer conference, Williams auditorium, Umberger Hall, Kansas State University, Manhattan, Kansas.

Nov. 30—12th Annual North Dakota Fertilizer Dealers Conference, Student Union Ballroom, North Dakota Agricultural College, Fargo, N.D.

1961

Jan. 17-18—Annual meeting, Georgia Plant Food Educational Society, Georgia Center for Continuing Education, Athens, Ga.

Jan. 25-26—Custom Spray Operators' Training School, 13th annual meeting, University of Illinois, Urbana.

Jan. 26-27 — Colorado Agricultural Chemicals Assn., annual meeting, Cosmopolitan Hotel, Denver, Colo.

Feb. 6-8—58th annual meeting, Association of Southern Agricultural Workers, Agronomy Section, King Edward Hotel, Jackson, Miss.

Meeting Memos listed above are being listed in this department this week for the first time.

Nov. 22—Tenth Semi-Annual Meeting, Manufacturing Chemists' Assn., Statler Hilton Hotel, New York City.

Nov. 28-30—Soil and Crop Science Society of Florida, Fort Harrison Hotel, Clearwater, Fla.

Nov. 28-Dec. 1—Eighth Annual Meeting, Entomological Society of America, Haddon Hotel, Atlantic City, N.J.

Nov. 29—Oklahoma Fertilizer Dealers Conference, Oklahoma Plant Food Educational Society and Oklahoma State University cooperators, Huckins Hotel, Oklahoma City, Okla.

Nov. 30—New Jersey annual fertilizer conference, Rutgers University, New Brunswick, N.J. Sponsored by Plant Food Educational Society of New Jersey.

Dec. 1-2—Ohio Fertilizer and Lime Conference, Agricultural Administration Building, Ohio State University, Columbus, Ohio.

Dec. 4-7—Winter Meeting, American Society of Agricultural Engineers, Peabody and Chisca Hotels, Memphis, Tenn.

Dec. 5—Washington Liquid Fertilizer Dealers Assn., Annual Meeting, Davenport Hotel, Spokane, Wash.

Dec. 5—Annual Meeting, Washington Liquid Fertilizer Dealers Assn., Davenport Hotel, Spokane, Wash.

Dec. 5-7—Annual Meeting, Carolinas-Virginia Pesticide Formulators Assn., Carolina Hotel, Pinehurst, N.C.

Dec. 5-8—American Society of Agronomy meeting, Morrison Hotel, Chicago.

Dec. 12-14—North Central Weed Control Conference, Hotel Schroeder, Milwaukee, Wis. T. W. Tibbets, Department of Horticulture, University of Wisconsin, Madison, public relations committee.

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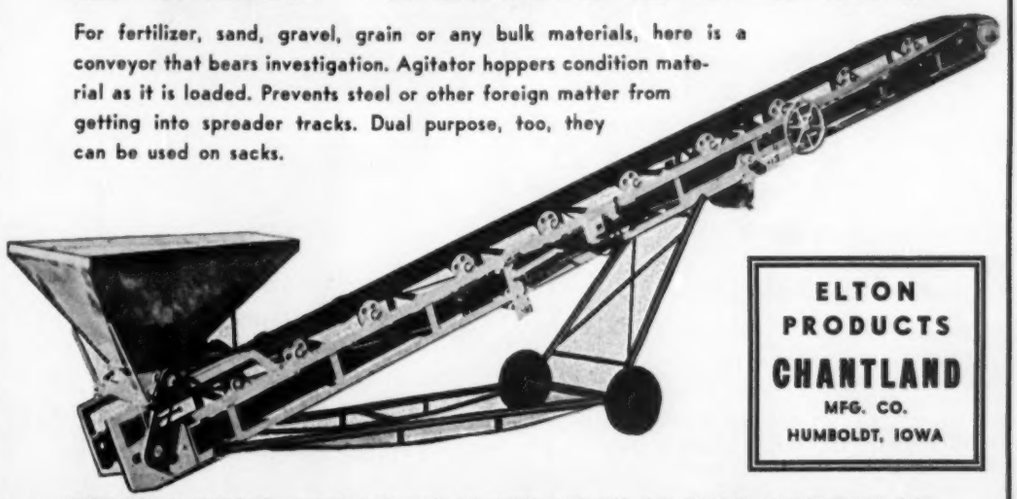

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